INVESTIGATION OF WELDING THERMAL STRAINS IN HIGH STRENGTH QUENCHED AND TEMPERED STEEL

Mark D. Lipsey

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TITLE (and Subitile)		3. TYPE OF REPORT & PERIOD COVERED
INVESTIGATION OF WELDING THERMAL STRAINS IN HIGH STRENGTH QUENCHED AND TEMPERED STEEL 7. AUTHOR(*) LIPSEY, MARK D.		THESIS
		6. PERFORMING ORG. REPORT NUMBER
		6. CONTRACT OR GRANT NUMBER(0)
PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
MASS. INST. OF TECHNOLOGY		
. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE
NAVAL POSTGRADU	UATE SCHOOL	JUNE 78
CODE 031 MONTEREY, CALIFOR	RNIA, 93940	130
. MONITORING AGENCY NAME & ADDRESS(If different	from Controlling Office)	18. SECURITY CLASS. (of this report)
		UNCLASS
		184. DECLASSIFICATION DOWNGRADING
DISTRIBUTION STATEMENT (of the ebetract entered i	n Block 20, if different fro	m Report)
SUPPLEMENTARY NOTES		
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by

MARK D. LIPSEY

Submitted to the Department of Ocean Engineering on May 12, 1978 in partial fulfillment of the requirements for the Degree of Ocean Engineer and to the Department of Materials Science and Engineering on May 12, 1978 in partial fulfillment of the requirements of the Degree of Master of Science in Materials Engineering.

ABSTRACT

Previous studies of transient thermal strains during welding of high strength quenched and tempered steels are discussed. Data on the transient strain and temperature response during welding experiments on HY-130 and low carbon steel are presented. The experiments consisted of unrestrained, multipass, butt welds in one inch thick plates.

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Recommendations are made which include a comparison of results with a two-dimensional computer analysis and a metallurgical characterization of both the weld metal and the base metal near the weld.

Thesis Supervisor: Koichi Masubuchi

Title: Professor of Ocean Engineering and Materials Science

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by

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B.S., Metallurgy and Materials Science
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(1970)

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE

DEGREE OF

OCEAN ENGINEER

AND FOR THE DEGREE OF

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at the

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ACKNOWLEDGEMENTS

I wish to thank many individuals at MIT who were of great assistance to me in my thesis research. Mr. Fred Merlis of MIT's Aerolastic Laboratory, Mr. Anthony Zona of the Materials Joining Laboratory, and Mr. Robert Huston of the Materials Processing Laboratory were especially helpful in the preparation and conduct of my welding experiments, and special thanks goes to Professor Koichi Masubuchi for his advice and support of my work. I am also indebted to Mr. Ivo Fioretti of the Naval Ship Engineering Center and Mr. Jim Peck of Mare Island Naval Shipyard for providing the material necessary for my research.

Finally, I thank Ms. Debbie Schmitt for her great perception and perseverance in typing this thesis.



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CHAPTER I

INTRODUCTION

A. Background

Welding is the most widely used form of joining in the fabrication of marine structures. It is used almost exclusively in the fabrication of naval vessels for welding offers many advantages over other forms of joining. These advantages include a reduction in structural weight, an increase in structural strength, and ease of attaining air and water tightness. However, welding does suffer from a few disadvantages which derive from the local heating which occurs during the welding process. Complex thermal stresses which occur during welding may cause cracking and mismatching. High tensile residual stresses near the weld may promote fracture and fatigue crack propagation. Distortion and compressive residual stress may reduce the buckling strength of structural members.

For many years the development of high strength steels for use in submarines and deep diving submersibles has been pursued in order to lower structural weight, provide for an increase in depth, and to improve the safety characteristics of submersibles. The direction this development has taken is toward the use of quenched and tempered steels. By use of proper production procedures,



it is possible to achieve high strength levels as well as superior fracture toughness behavior in quenched and tempered steels. These two characteristics make the development of quenched and tempered steels highly desirable.

Since the mechanical properties of quenched and tempered steels are mainly derived from the heat treatment applied during production, it follows that the heat input which occurs during welding will have a large effect on the properties of the plate near the weld. The structure of the quenched and tempered steel will give rise to highly complex thermal strains near the weld. The exact nature of these strains is not well understood, but the ability to analytically predict the mechanical behavior of the weldment in these complex steels will avoid the huge costs of money, time, and manpower which would be required to empirically generate the data necessary to predict and avoid problems in all stages of fabrication. The key to analytically predicting and avoiding problems during the later stages of fabrication is to develop the ability to predict residual stresses and distortion resulting from welding. The most reliable method of achieving this aim is to accurately predict the thermal strains which occur in the metal near the weld line



during the entire welding process.

B. Previous Work in Welding Analysis

The passage of a welding arc induces the formation of complex stresses and strains in the base metal near the weld line. This phenomenon is primarily due to the nature of the heat source in that a welding arc causes not only local heating but this local heating source is constantly moving. Therefore, the temperature distribution in the metal is non-uniform and it is this non-uniformity of temperature distribution which causes thermal strains to develop and change during the welding process. At the conclusion of welding, residual strains and stresses will remain in the metal.

The formation of thermal strains and stresses near the weld line in a low carbon steel, which is due to the passage of the welding arc, is best described by Masubuchi [10] and is repeated here.

"Figure 1 shows schematically how residual stresses are formed in a weld. Figure la shows a bead-on-plate weld in which a weld bead is being laid at a speed v.

O-xy is the coordinate axis; the origin, O, is on the surface underneath the welding arc, and the x direction lies in the direction of welding.



Figure 1b shows temperature distribution along several cross sections. Along Section A-A, which is ahead of the welding arc, the temperature change due to welding, AT, is almost zero (Figure 1b-1). Along Section B-B, which crosses the welding arc, the temperature distribution is very steep (Figure 1b-2). Along Section C-C, which is some distance behind the welding arc, the distribution of temperature change is as shown in Figure 1b-3. Along Section D-D, which is very far from the welding arc, the temperature change due to welding again diminishes (Figure 1b-4).

Figure 1c shows the distribution of stresses along these sections in the x direction, σ_x . Stress in the y direction, σ_y , and shearing stress, τ_{xy} , also exist in a two-dimensional stress field.

Along Section A-A, thermal stresses due to welding are almost zero (Figure lc-1). The stress distribution along Section B-B is shown in Figure lc-2. Stresses in areas underneath the welding arc are close to zero, because molten metal does not support loads. Stresses in areas somewhat away from the arc are compressive, because the expansion of these areas is restrained by surrounding areas that are heated to lower temperatures. Since the temperatures of these areas are quite high and the yield strength



of the material is low, stresses in these areas are as high as the yield strength of the material at corresponding temperatures. The amount of compressive stress increases with increasing distance from the weld or with decreasing temperature. However, stresses in areas away from the weld are tensile and balance with compressive stresses in areas near the weld. In other words,

$$\int \sigma_{X} \cdot dy = 0$$

across Section B-B. Thus, the stress distribution along Section B-B is as shown in Figure 1c-2.

Stresses are distributed along Section C-C as shown in Figure 1c-3. Since the weld-metal and base-metal regions near the weld have cooled, they try to shrink causing tensile stresses in areas close to the weld. As the distance from the weld increases, the stresses first change to compressive and then become tensile.

Figure 1c-4 shows the stress distribution along
Section D-D. High tensile stresses are produced in areas
near the weld, while compressive stresses are produced in
areas away from the weld. The distribution of residual
stresses that remain after welding is completed is shown
in the figure.



The cross-hatched area, MM', Figure la shows the region where plastic deformation occurs during the welding thermal cycle. The cross-hatched area near the origin 0 indicates the region where the metal is melted. The region outside the cross-hatched area remains elastic during the entire welding thermal cycle."

In the past twenty years, a number of research programs have been directed toward the development of analytical methods of analyzing the formation of these transient thermal strains and the resultant residual stresses and strains in weldments. In 1961, Tall [15] developed a simple computer program in the first significant attempt to use a computer in the analysis of thermal stresses during welding. In his study, temperature distribution was treated as a two-dimensional heat conduction problem but longitudinal stress, in the direction of the weld line, was assumed to be a function of the transverse distance only. Transverse stress and shear stress were assumed to be zero. This type of analysis was designated one-dimensional.

In 1968, Masubuchi, et.al. [11] further developed the above technique to handle thermal stresses in bead-on-plate welding. At MIT in 1970, Masubuchi [2] again improved the one-dimensional program. Later, Bryan [3] modified the



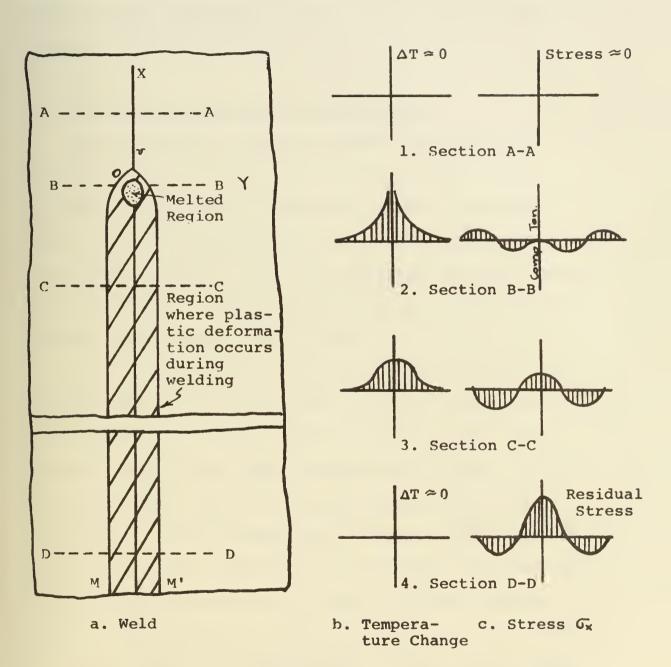


Figure 1 - Schematic Representation of Changes in Temperature and Stress During Welding



program so that different materials could be analyzed.

Provisions for multipass welding and heat losses from the surface were then incorporated into the program.

C. Previous Work on High Strength Steels

At MIT, study of thermal stresses resulting from welding of high strength steels has been done in two programs. Most recently, Hwang [6] studied transient thermal strains during welding and residual stresses in high strength steels. This work complemented that reported by Klein [7,8] on transient thermal strains resulting from welding high strength marine steels.

Klein's study [7] of transient thermal strains concentrated on the quenched and tempered marine steels, HY-80 and HY-130. HY-80 specimens were 1/4 inch thick and 3/4 inch thick and were welded bead-on-plate. The HY-130 specimens were 3/4 inch thick and were multipass butt welded. Strain changes were measured on the specimen surface by electric resistance strain gages and temperature on the surface was measured by adhesive bonded thermocouples. The analytical predictions for HY-80 steel did not agree closely with experimental results. The results of multipass welding of HY-130 showed sudden strain changes which occurred following the passage of the welding arc.



It has been speculated that these sudden strain changes may have been due to phase transformations occurring during cooling of the base metal. Another result was that the strains observed near the weld line decreased as the strength level of the base metal increased.

D. Aim and Purpose of Present Study

Most experimental work to date concerning transient thermal strains and stresses has been concentrated on single pass welding of thin plates. Where multipass welding has been studied, specimen plate thicknesses have not exceeded 3/4 inch. Because of this, it has not been adequately determined whether the computer programs developed to analytically predict thermal stresses and strains during welding are accurate for thicker sections.

The quenched and tempered steel to be used in future

U.S. Navy submarines and deep-diving submersibles is HY-130.

In order to achieve safe and efficient fabrication

procedures for this steel, it is necessary to understand

the formation of transient thermal strains during welding

in order to be able to predict the residual stresses present

after welding. Experimental data on transient thermal

strains in thick plates of HY-130 are not extensive and

further experiments to generate more data are needed to



increase the existing store of knowledge.

Therefore, the primary purpose of this investigation is to generate experimental data on transient thermal strains during welding of thick sections of HY-130 and low carbon steel. Experiments will consist of unrestrained butt welding by the multipass gas-metal-arc process.

Objectives of the experimental program include:

- (1) to verify previous experimental results on HY-130.
- (2) to determine the applicability of the

 MIT one-dimensional computer program to

 multipass welding of thick sections.
- (3) to provide useful information for the modification of the present program as well as for the development of more practical computer programs.



CHAPTER II

MATERIAL CHARACTERISTICS

The material chosen for this study is a high strength quenched and tempered steel which exhibits a minimum yield stress of 130 ksi. This steel has been developed by the U.S. Navy for use as hull plating and structural members in deep diving submersibles, and is designated HY-130. In addition to the extremely high yield stress, this steel exhibits very good energy absorption characteristics at low temperatures. The chemical composition of HY-130 quenched and tempered steel is presented in Table I. The mechanical properties of HY-130 in the "as received" condition are presented in Table II.

One test specimen was a low carbon steel with a designation 1020. This steel was chosen in order to provide further data on another material for use in validating and improving the MIT one-dimensional computer program. The nominal chemical composition of this steel and its mechanical properties are listed in Table III and Table IV respectively.

In order to analytically study the heat flow and thermal strains which occur during the welding process, it is necessary to know the physical and mechanical properties of the metal as a function of temperature, from room



TABLE I

COMPOSITION OF HY-130

Element	Weight Percent
Ni	4.75 - 5.25
Cr	0.40 - 0.70
Mn	0.60 - 0.90
Si	0.20 - 0.35
Мо	0.30 - 0.65
v	0.05 - 0.10
С	0.08 - 0.12
Р	0.010 maximum
s	0.015 maximum
Ti	0.02 maximum
Cu	0.25 maximum
Fe	Remainder

TABLE II

MECHANICAL PROPERTIES OF HY-130

Yield Stress	145 ksi
Tensile Stress	147 ksi
Elongation in 2 inches	20%
Reduction of Area	69%
V-Notch Requirements	60 ft-1bs at 70°F and 0°F



TABLE III

COMPOSITION OF 1020 STEEL

Element	Weight Percent
С	.1823
Mn	.3060
P	.04 maximum
S	.05 maximum
Fe	Remainder

TABLE IV MECHANICAL PROPERTIES OF 1020

Yield Stress	48 ksi
Tensile Stress	65 ksi
Elongation in 2 inches	36%
Reduction of Area	59%



temperature through melting temperatures. For most metals this information is not readily available and for HY-130 no systematic study has been made to determine these physical and mechanical properties at elevated temperatures. However, in his study of fracture of welds of HY-130, Schrodt [13] developed curves for the physical and mechanical properties of HY-130 as functions of temperature which he derived from data published in References [1,5,9, 12, and 16]. At the present time, these curves are the most valid approximations for the properties at elevated temperatures which are available. The mechanical and physical properties of HY-130 as functions of temperature are presented in Figures 2-7. These physical and mechanical properties for 1020 steel can be found in the literature [4] and are presented as functions of temperature in Figures 8-13.



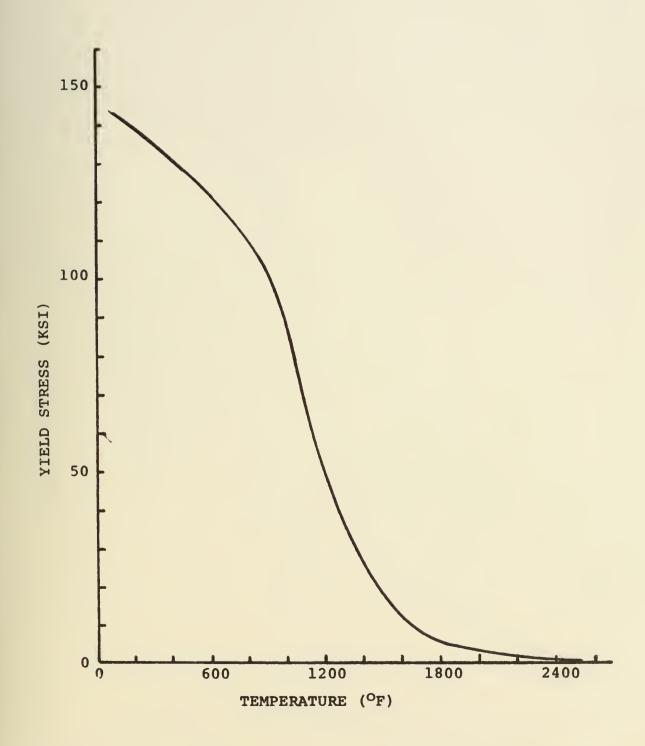


Figure 2 - Estimated Effect of Temperature on 0.2% Offset Yield Stress for HY-130



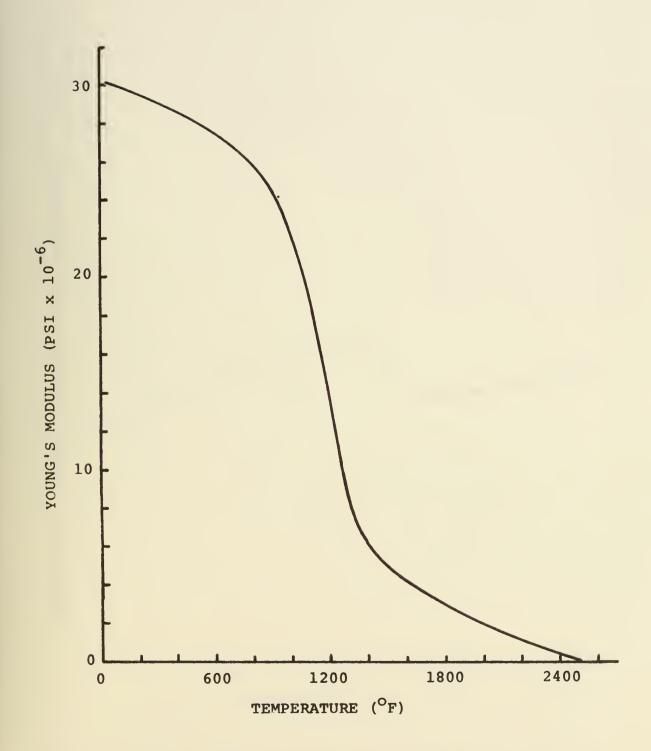


Figure 3 - Estimated Effect of Temperature on Young's Modulus for HY-130



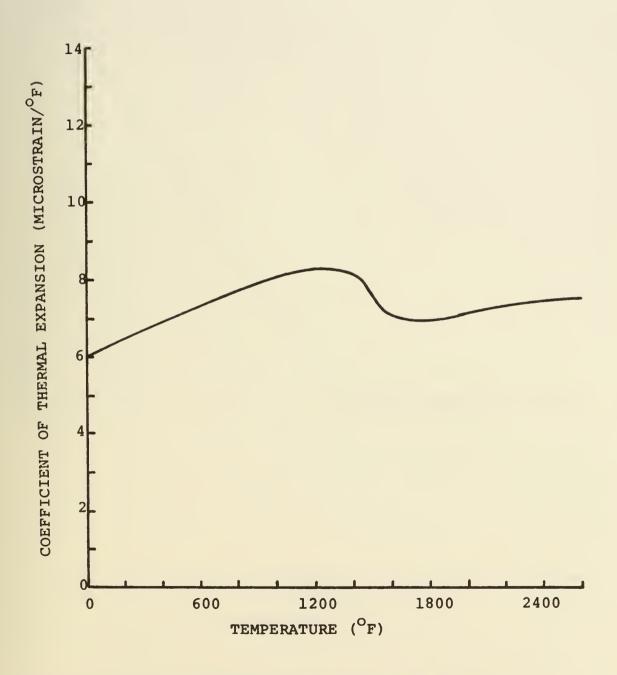


Figure 4 - Estimated Effect of Temperature on the Coefficient of Thermal Expansion for HY-130



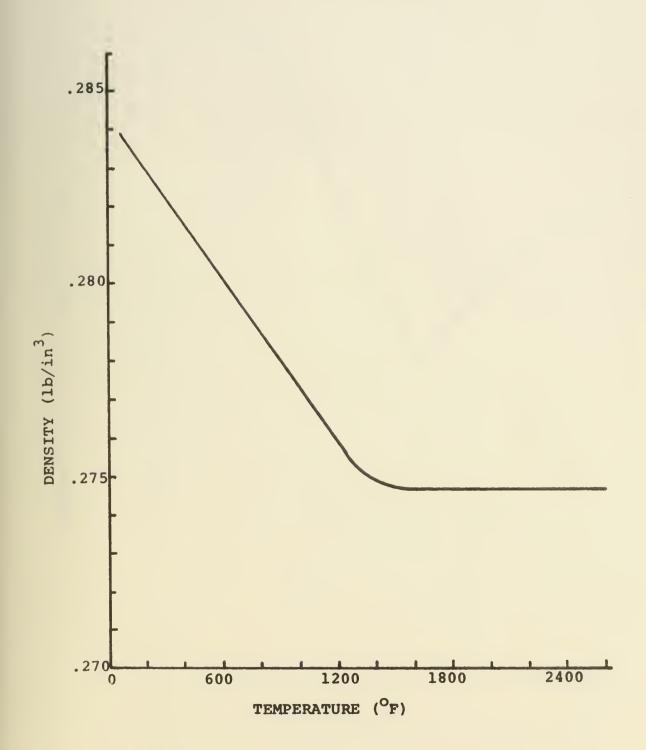


Figure 5 - Estimated Effect of Temperature on Density of HY-130



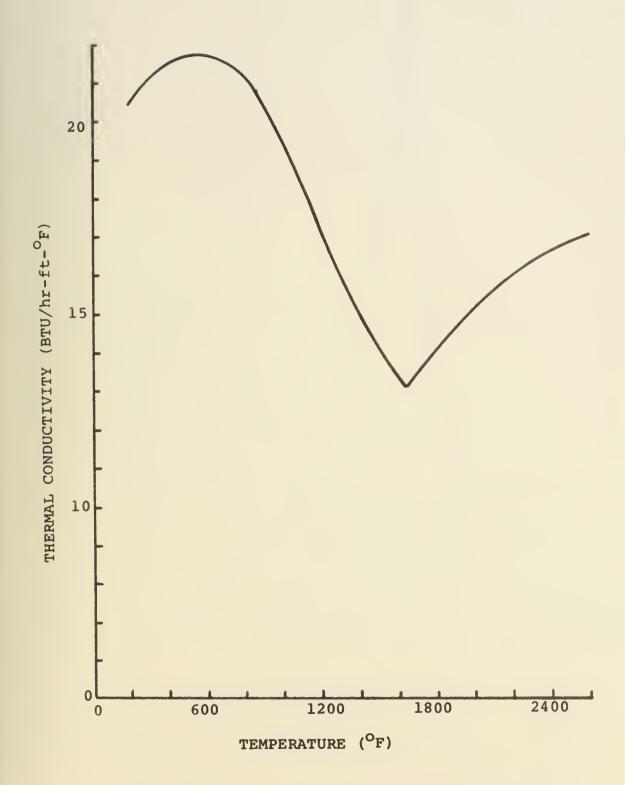


Figure 6 - Estimated Effect of Temperature on the Thermal Conductivity of HY-130



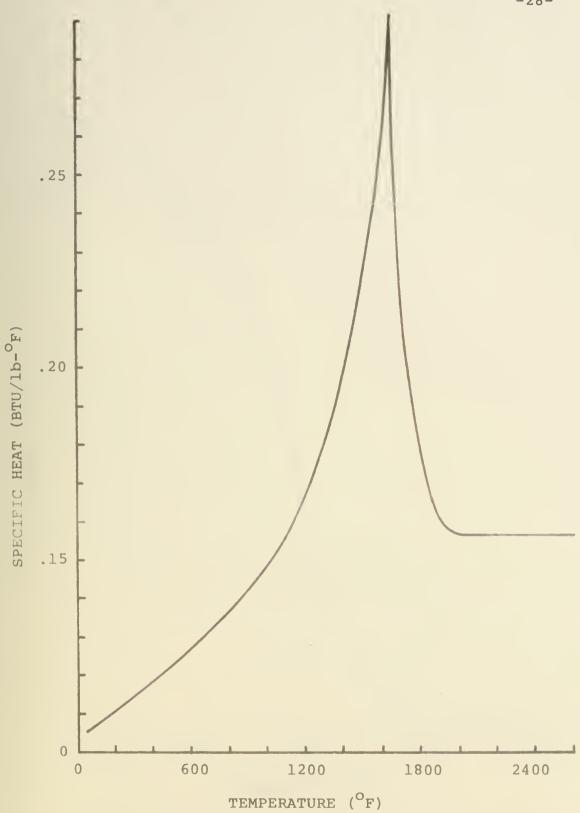


Figure 7 - Estimated Effect of Temperature on Specific Heat of HY-130



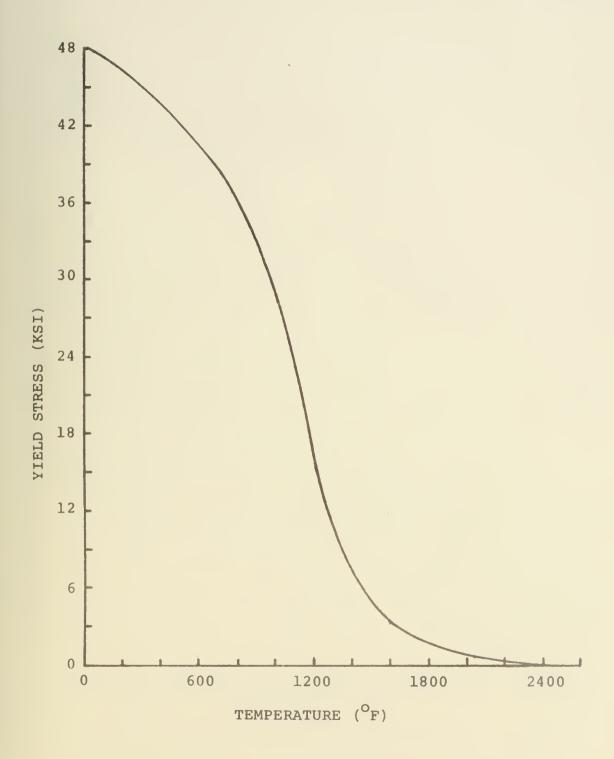


Figure 8 - Estimated Effect of Temperature on 0.2% Offset Yield Stress for 1020 Steel



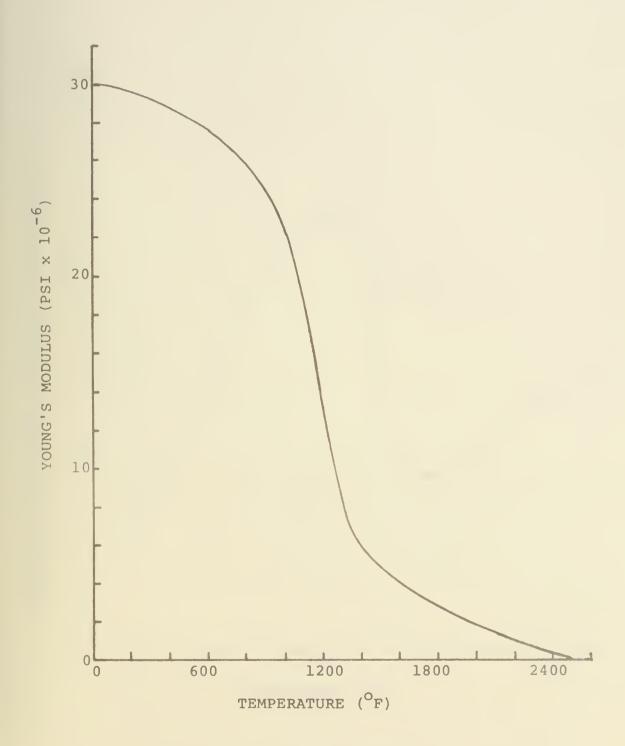


Figure 9 - Estimated Effect of Temperature on Young's Modulus for 1020 Steel



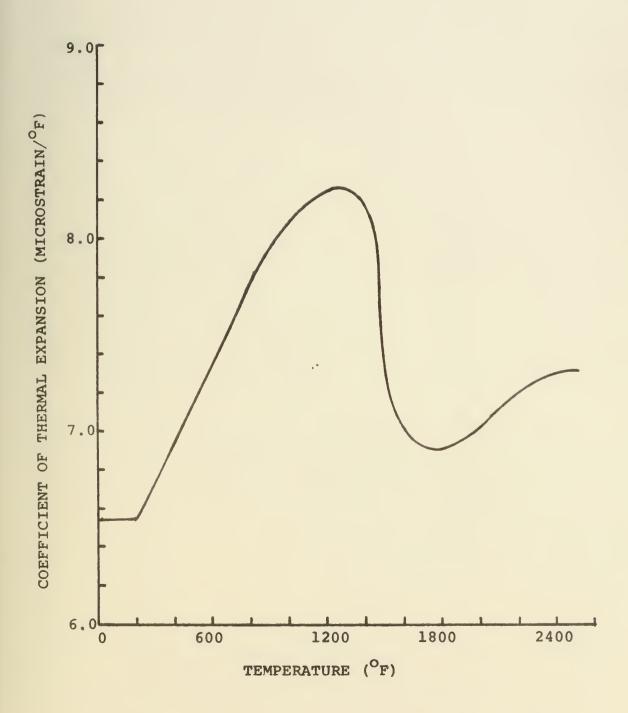


Figure 10 - Estimated Effect of Temperature on the Coefficient of Thermal Expansion for 1020 Steel



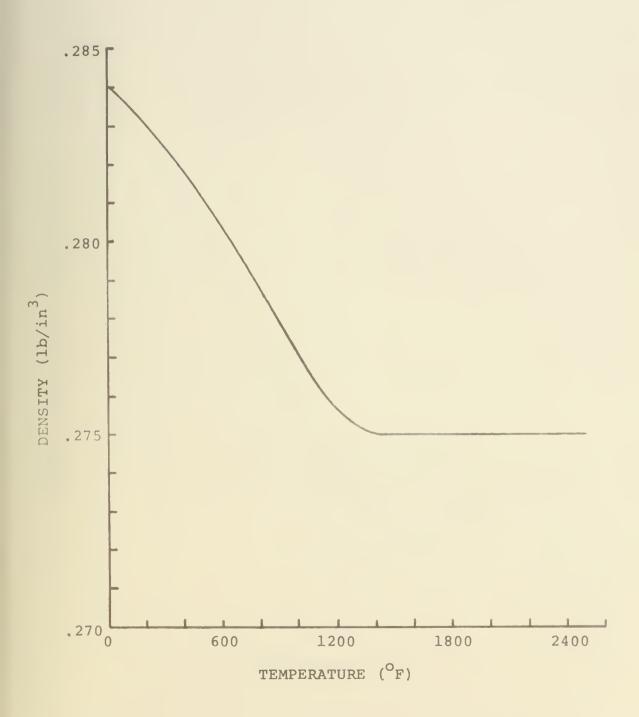


Figure 11 - Estimated Effect of Temperature on Density of 1020 Steel

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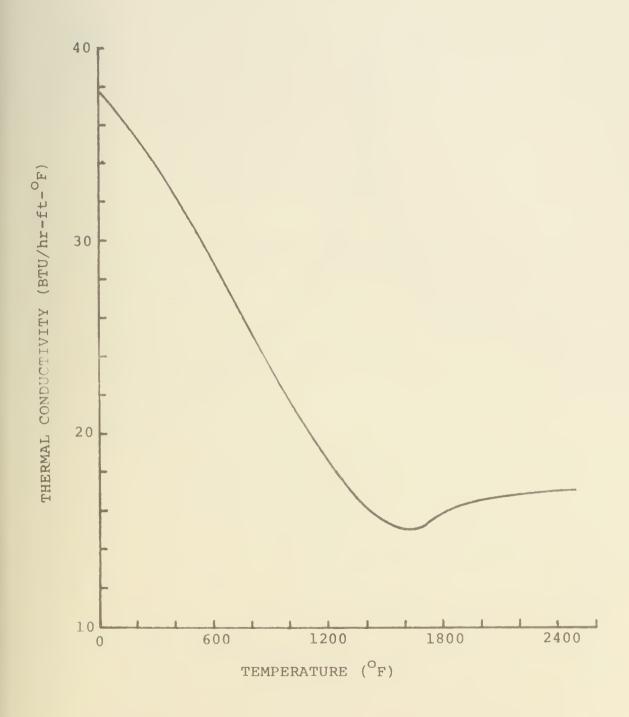


Figure 12 - Estimated Effect of Temperature on the Thermal Conductivity of 1020 Steel



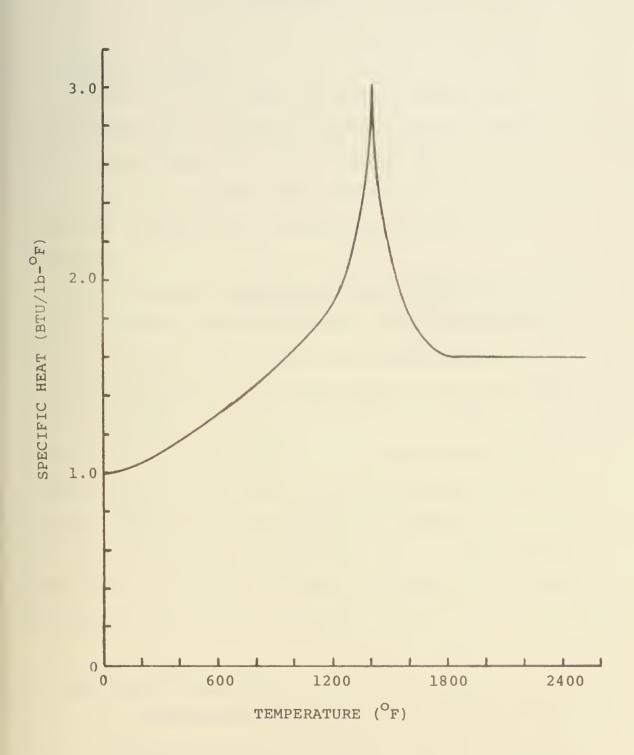


Figure 13 - Estimated Effect of Temperature on Specific Heat of 1020 Steel



CHAPTER III

PROCEDURES

A. Scope of Research

A series of three experiments was conducted to measure temperature changes and thermal strains which occur in thick plate during multipass welding of unrestrained butt joints. Metal movement, as measured by transverse shrinkage, was measured during one of the experiments.

The two primary experiments were conducted with HY-130 steel, a quenched and tempered steel under development by the U.S. Navy for use in deep diving submersibles. U.S. Navy specifications for the fabrication of this steel by the Gas-Metal-Arc method were followed as closely as possible. The third experiment was conducted with a low carbon steel (by using the Gas-Metal-Arc method of welding). The data obtained experimentally were compared to analytical predictions of temperature and strain produced by the MIT one-dimensional computer program for the analysis of thermal strains during welding.

B. Measurement of Strain

Strain measurements were made on the surface of the metal plate by use of adhesive bonded, electric resistance



strain gages. This method of strain measurement on the test plate is used extensively and is a convenient and accurate method of measurement. When measuring strain with resistance strain gages, the total resistance change measured, ΔR , consists of resistance changes taking place in the test plate due to mechanical strains and thermal strains as well as resistance changes due to thermal strain and thermo-electric changes in the strain gage itself. In the case of welding thermal strains, the total resistance change can therefore be expressed in the following way:

$$\Delta R = \Delta R(e) + \Delta R(p) + \Delta R(T) + \Delta R(g)$$

where

- ΔR(e) = resistance change due to elastic strain
 in the test plate.
- ΔR(p) = resistance change due to plastic strain
 in the test plate.
- ΔR(T) = resistance change due to temperature induced thermal strain in the gage.
- $\Delta R(g)$ = resistance change due to thermoelectric effects in the gage.



In studying welding thermal strains, the measurements of interest are $\Delta R(e)$ and $\Delta R(p)$. These can be separated out from ΔR if $[\Delta R(T) + \Delta R(g)]$ can be determined throughout the temperature range. This correction has been made by the gage manufacturer and is supplied with the gages in the form of a curve of apparent strain versus temperature. Therefore,

$$E\Delta R(e) + E\Delta R(p) = E\Delta R - A.S.$$

where A.S. = apparent strain.

C. Apparatus

1. Specimen Preparation

All experiments consisted of the unrestrained butt welding of one inch thick plates. Each plate measured approximately 12" x 24" and after welding created a plate with dimensions 24" x 24". In accordance with U.S. Navy specifications, the weld joint configuration chosen was a double-V groove with a 60° included angle. The plates were first flame cut to their 12" x 24" dimensions and then the edges to be welded were machined to the proper configuration. The surfaces of the plates near the weld line were mechanically cleaned in order to remove as much



potential weld contamination as possible. The specimen arrangement and weld joint configuration are shown in Figures 15 and 16 respectively.

2. Instrumentation

Strain on the surface of the specimen plates was measured by electric resistance strain gages set at varying transverse distances from the weld line, but at the same longitudinal position. The strain gages consisted of a 90° pair which allowed the simultaneous measurement of longitudinal and transverse strains during welding. The strain gage specifications are contained in Table V and the curve of apparent strain versus temperature for these gages is shown in Figure 14.

Temperature was measured on the surfaces of the specimen plates by use of Chromel/Alumel adhesive bonded thermocouples referenced to 32°F. These thermocouples were positioned at transverse positions from the weld line corresponding to the transverse positions of the strain gages. On the Specimen I HY-130 plate and on the low carbon steel specimen plate, the thermocouples were positioned 0.5 inches ahead of the strain gages. On the Specimen II HY-130 plate, the thermocouples were positioned 1.0 inches ahead of the strain gages. When reducing the



data, the time the welding arc passed the thermocouples was referenced to the time the arc passed the position of the strain gages so that correct corresponding values of temperature and strain were obtained.

Temperature and strain were simultaneously read out on a twelve channel, continuous recording Visicorder.

Thermocouple and strain gage locations are indicated in Figures 18 - 21.

D. Experiment Procedure

Welding on all tests was performed by the semiautomatic gas-metal-arc method (GMA), using a SVI-300 power
supply and associated controls manufactured by the Linde
Division of Union Carbide Corporation. Arc travel speed,
voltage, and amperage were set prior to the start of
welding on each test specimen in order to obtain the
desired heat input. Pre-heat was applied by oxygenacetylene torches and monitored by the installed thermocouples. Interpass temperature was also monitored by the
installed thermocouples.

The test plates were lined up with the welding head and tack welded together at one end. The welding head was then moved to the starting end of the weld line and preheat was applied to the plates. When the temperature of



TABLE V

STRAIN GAGE PROPERTIES

Gage SR-4 90°

Designation FAET-18D-12-S6

Manufacturer BLH Electronics

Grid Dimensions .19 x .19 inches

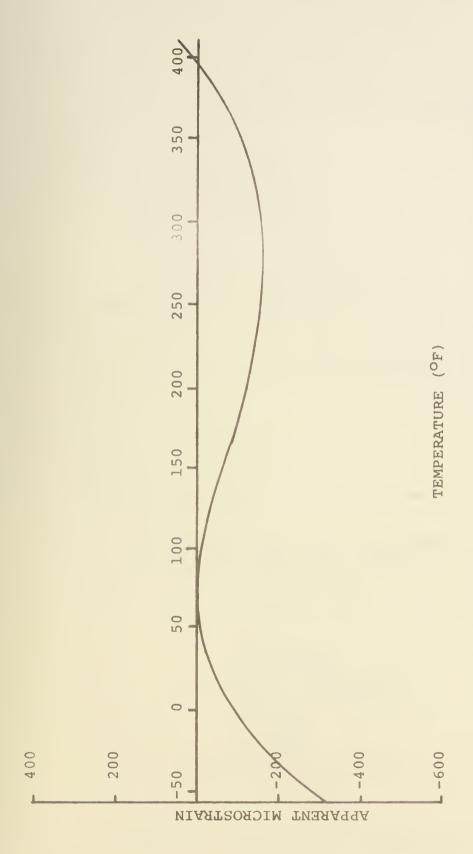
Temperature Range -100 - 500°F

Resistance 120 Ohms

Gage Factor 1.98

Cement EPY-500





Effect of Temperature on Apparent Strain for SR-4 Strain Gage ŀ 14 Figure



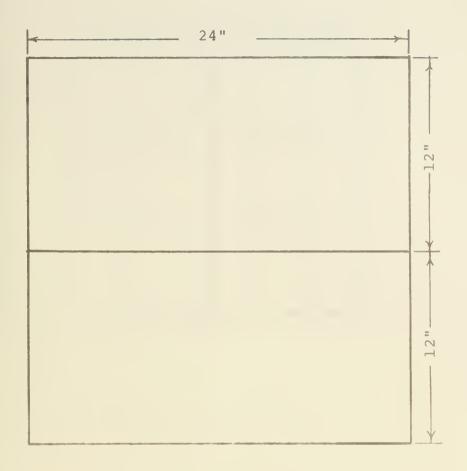


Figure 15 - Test Plate Arrangement

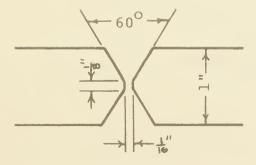
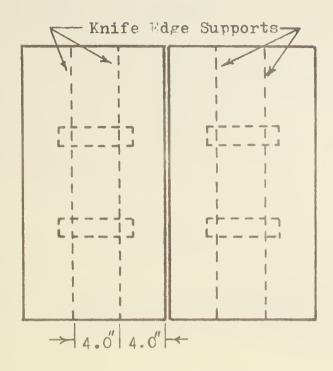


Figure 16 - Weld Joint Configuration





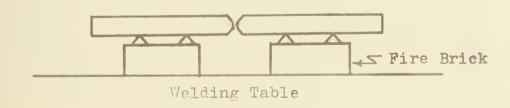


Figure 17 - Test Plate Support Arrangement



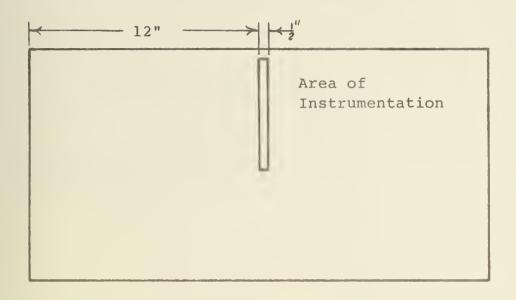


Figure 18 - Location of Instrumentation on HY-130 Specimen I and 1020 Steel

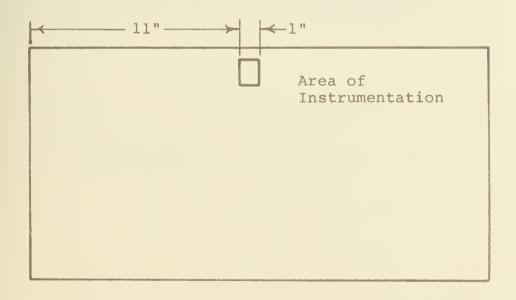


Figure 19 - Location of Instrumentation on HY-130 Specimen II



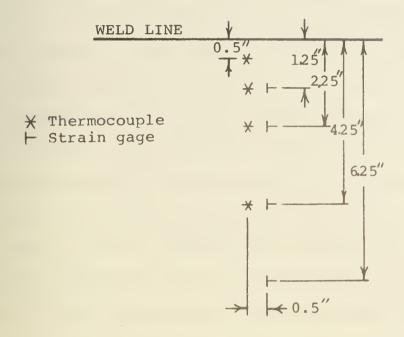


Figure 20 - Thermocouple and Strain Gage Location on HY-130 Specimen I and 1020 Steel

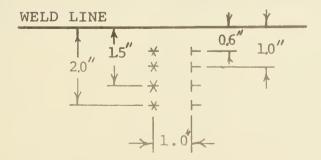


Figure 21 - Thermocouple and Strain Gage Location on HY-130 Specimen II



the test specimen, as measured by the thermocouples, averaged between 150°F and 175°F, the visicorder was actuated and an arc was struck to begin the first pass. When the arc reached the end of the weld line, it was extinguished and the welding head was returned to the starting point. The visicorder continued to record temperatures and strains continuously for approximately one minute and then intermittently until the next pass was to be made. The test specimen air cooled until the desired interpass temperature range of 150°F-175°F was reached as measured by the thermocouple nearest the weld line. At this point the visicorder was actuated, the arc struck, and the process repeated for the next pass. procedure was repeated for each of the six passes needed to fill the upper half of the double-V groove. After the completion of the sixth pass, the test specimen was allowed to cool to room temperature. Welding conditions are summarized in Table VI.



TABLE VI

TEST PLATE	1020	HY-130 SPECIMEN I	HY-130 SPECIMEN II
WELD TYPE	BUTT	BUTT	BUTT
PROCESS	GMA	GMA	GMA
ARC VOLTS	26	25	25
POLARITY	DCRP	DCRP	DCRP
TRAVEL SPEED (rpm)	12	12	12
HEAT INPUT (Kjoules/in)	39	37	37
FILLER WIRE	.0625" A-675	0.045" Linde-140	0.045" Linde-140
SHIELDING GAS	AR, 25% CO ₂	AR, 2% 02	AR, 2% 0 ₂
NUMBER OF PASSES	9	9	9
PREHEAT & INTER PASS TEMP.	150-175°F	150-175°F	150-175°F

WELDING CONDITIONS



CHAPTER IV

RESULTS

A. Presentation of Data

The experimental results are presented as measurements of longitudinal strain versus time for the strain results and temperature versus time for the temperature measurements. The time axis refers to the time elapsed from the start of one pass until the start of the next pass. The time scales for each pass have been adjusted and the data is presented so that the arc passes the point of observation at the time of 40 seconds. This point is marked on each graph. This manipulation of time scales is permissable because there is minimal movement in either temperature or strain during the first 20 seconds of each pass. Note the change in scale at 100 seconds to that of a log plot from 100 to 1000 seconds. Temperature is measured in degrees Fahrenheit. Longitudinal strain is presented as units of microstrain, which equals 10^{-6} in/in.

Figures 22 through 31 present the experimental mechanical strain results for HY-130. First, the results for Specimen I are presented with the longitudinal strain measured at 1.25", 2.25", and 4.25" from the weld line presented in a graph for each of the passes 2-6. The strain and temperature movement measured at 6.25" were



minimal and therefore are not presented. The results for Specimen II are then presented, with the longitudinal strain measured at 1.0", 1.5", and 2.0" from the weld line shown on graphs for passes 2-6. The longitudinal strain measurements at 0.6" from the weld line on Specimen II are shown in Figure 32. These were separated from the other HY-130 results because of the uniqueness of the curves. The results shown are for passes 2, 3, and 5. Pass 4 is very similar to pass 3 and the results for pass 6 are unreliable because the temperature of the strain gage greatly exceeded the maximum allowable temperature of the gage for a significant amount of time.

Figures 33 through 37 present the experimental mechanical strain results for 1020 steel. The longitudinal strain measured at 1.25", 2.25", and 4.25" from the weld line are presented together for each pass, 2-6. The strain measured at 6.25" from the weld line was insignificant and therefore not presented.

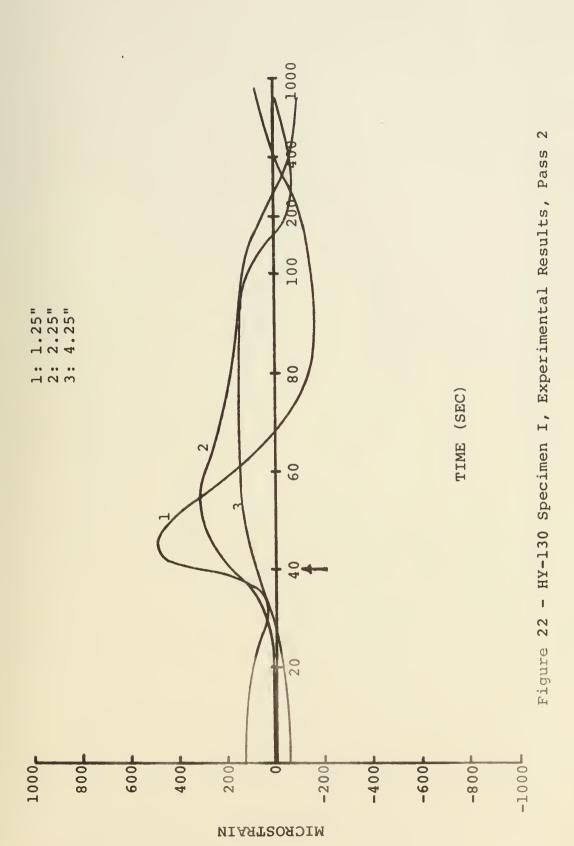
Figures 38 through 46 show comparisons between experimental results and predictions by the one-dimensional computer program for both temperature and longitudinal strain. The results shown are for pass 3 and are entirely representative of the comparisons for the other passes.

The results for HY-130, both measured and predicted at

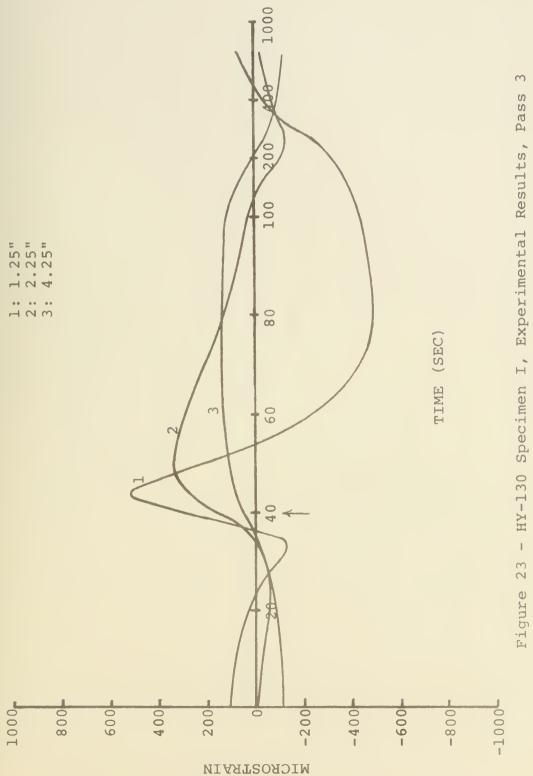


1.0", 1.25", 2.0", 2.25", and 4.25" from the weld line, are presented as well as the results for 1020 steel at 1.25", 2.25", and 4.25" from the weld line.



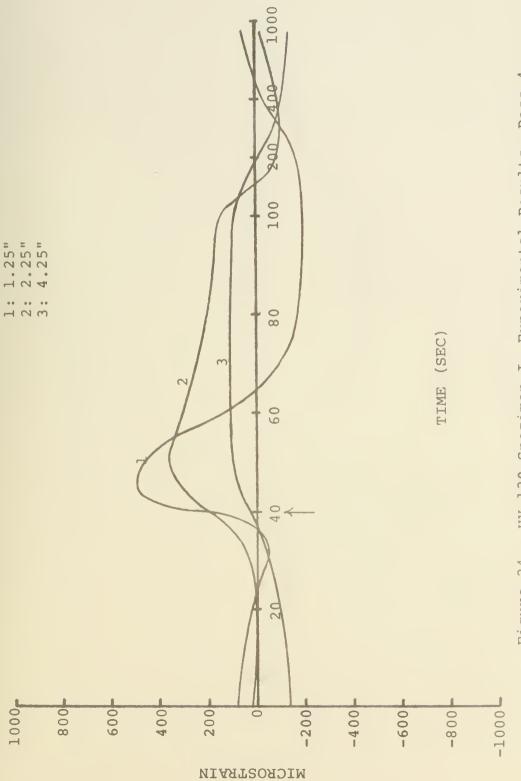






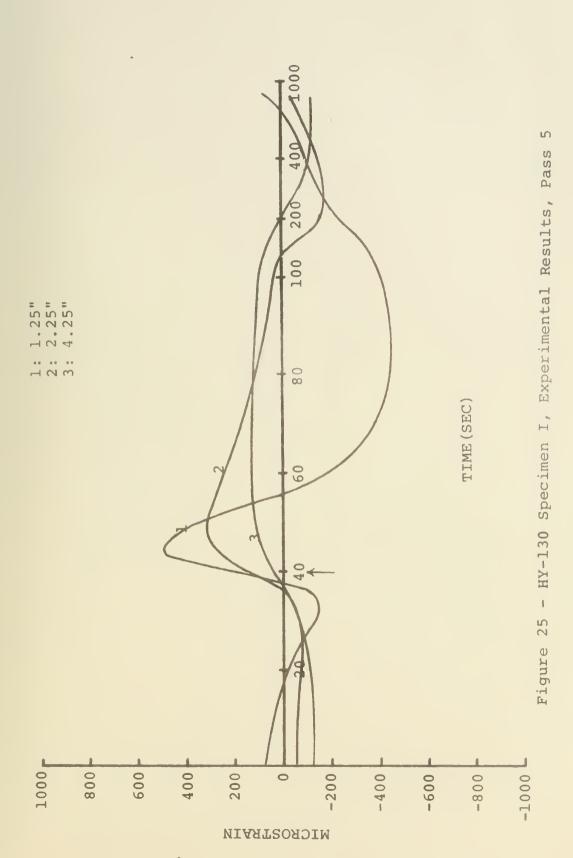
Pass HY-130 Specimen I, Experimental Results, 1 23



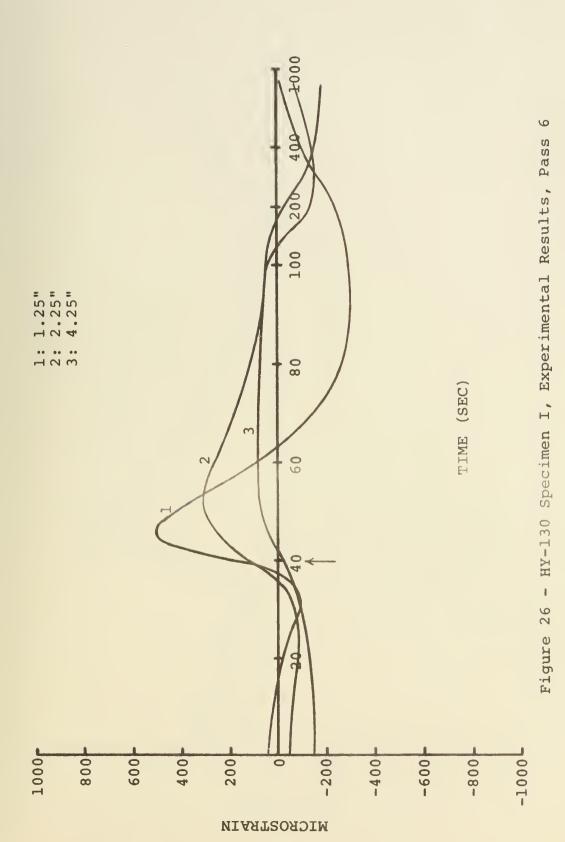


HY-130 Specimen I, Experimental Results, Pass Figure

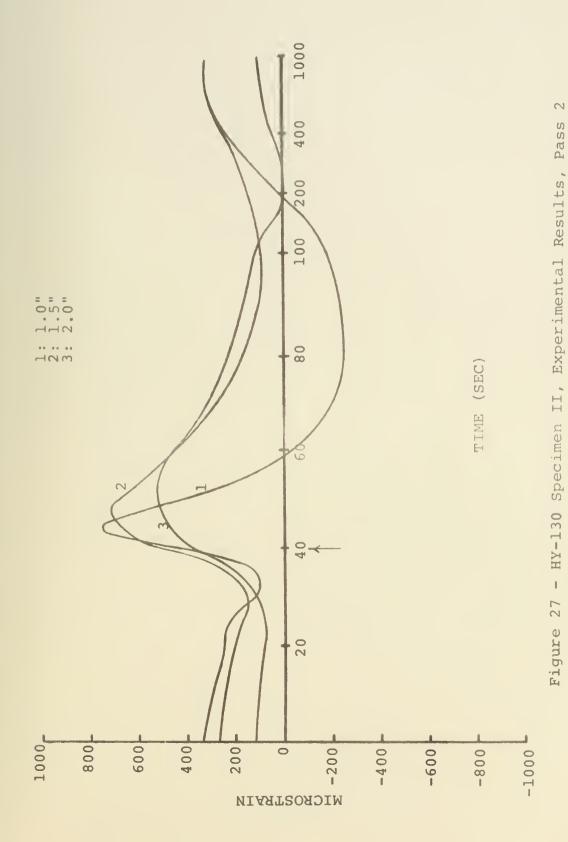




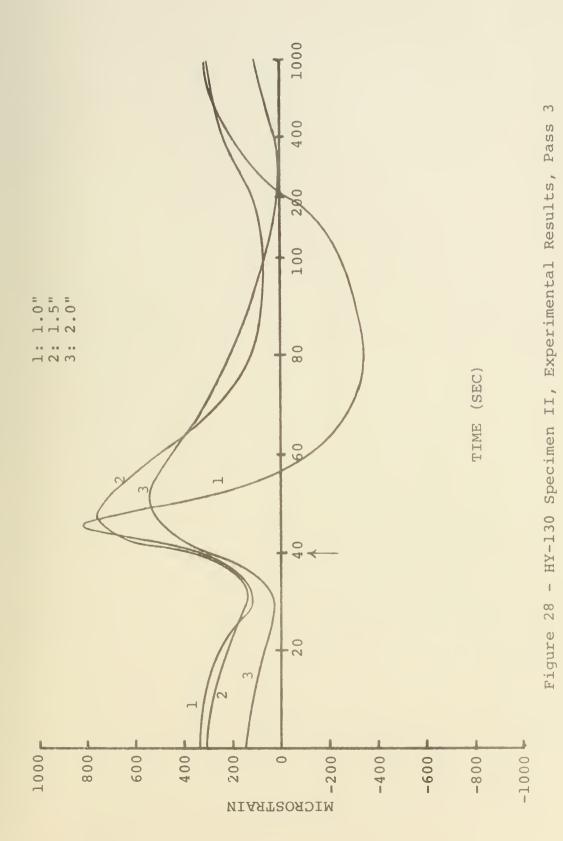




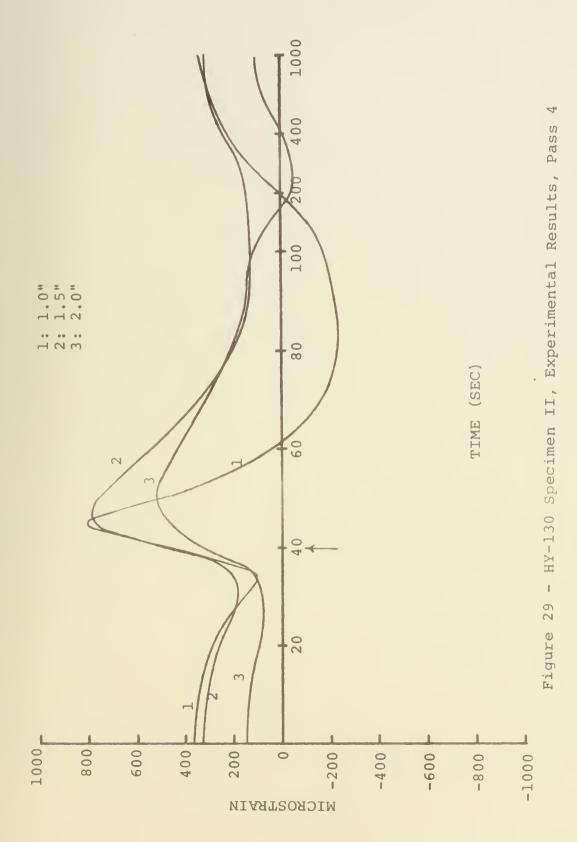




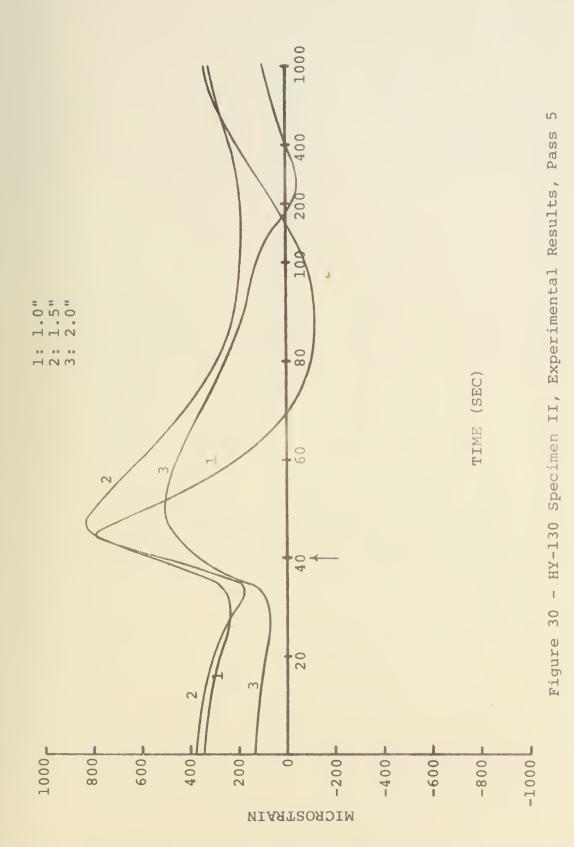




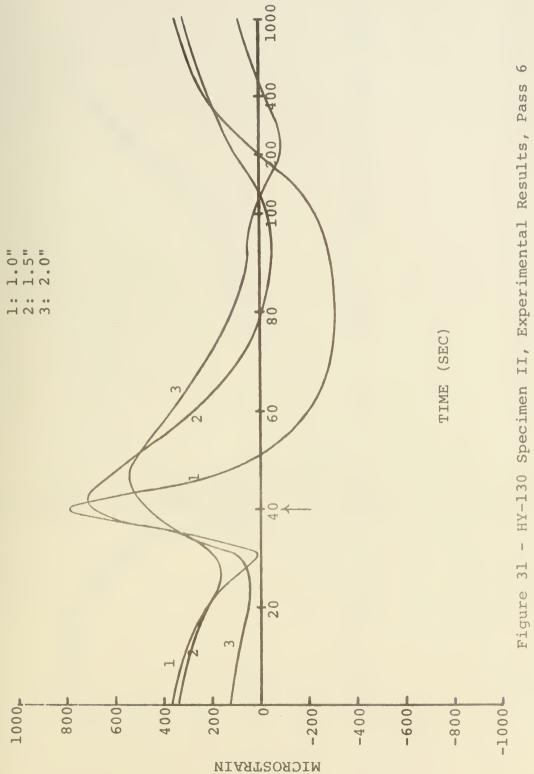




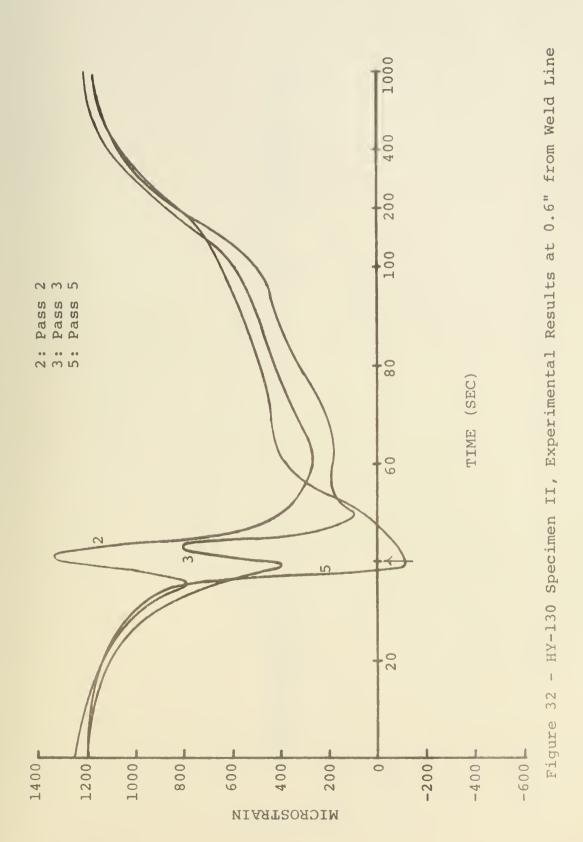




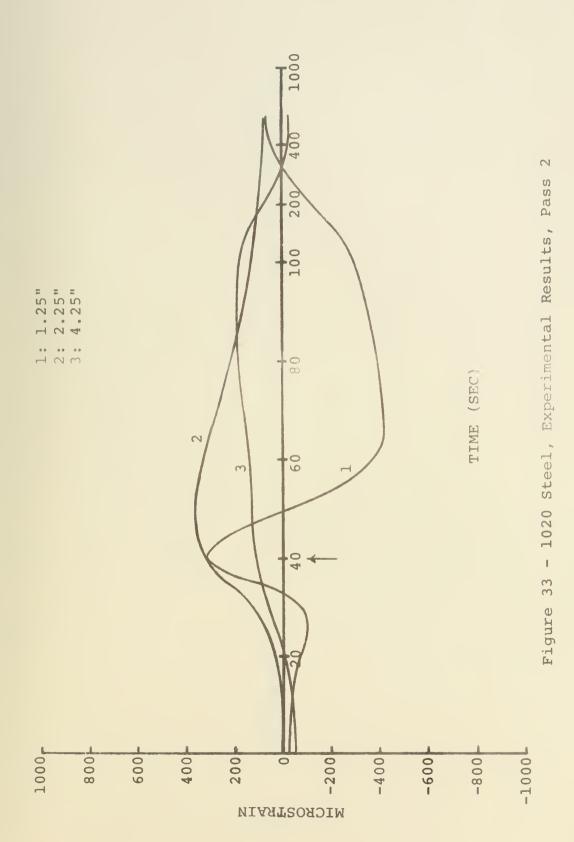




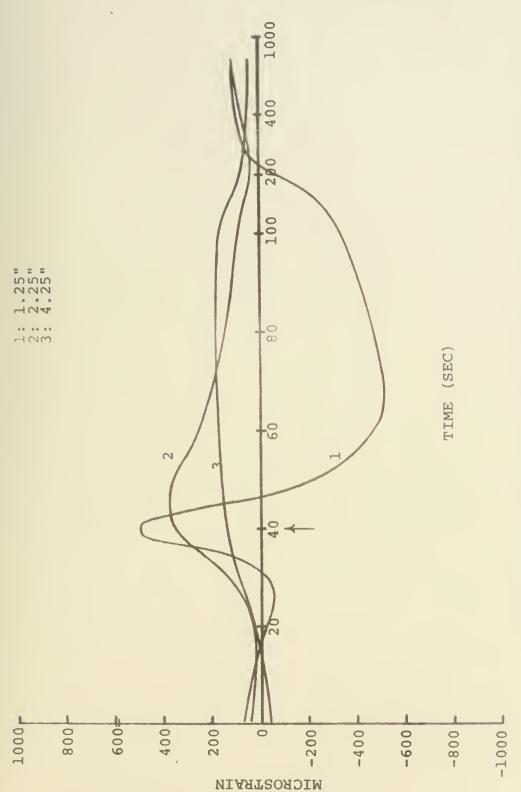






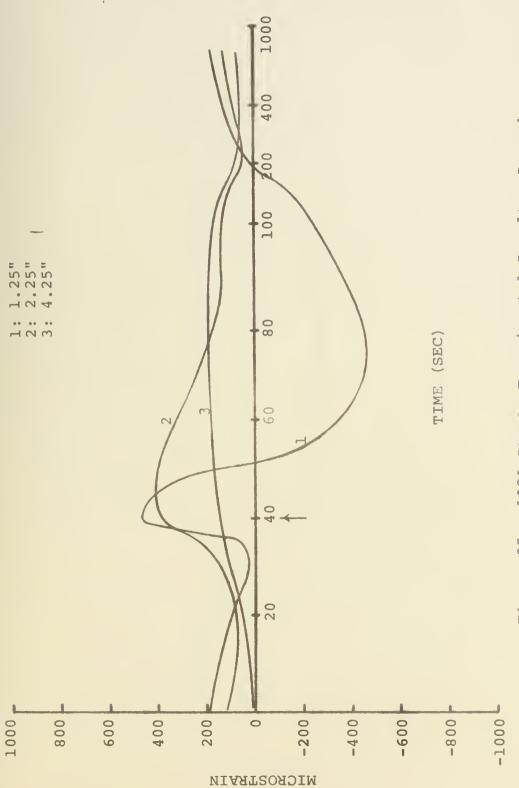






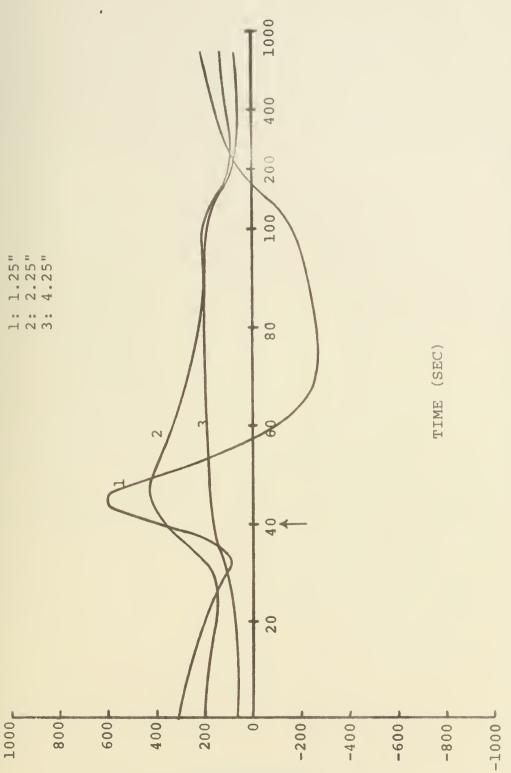
 \sim Pass 1020 Steel, Experimental Results, 34 Figure





4 1020 Steel, Experimental Results, Pass I Figure 35

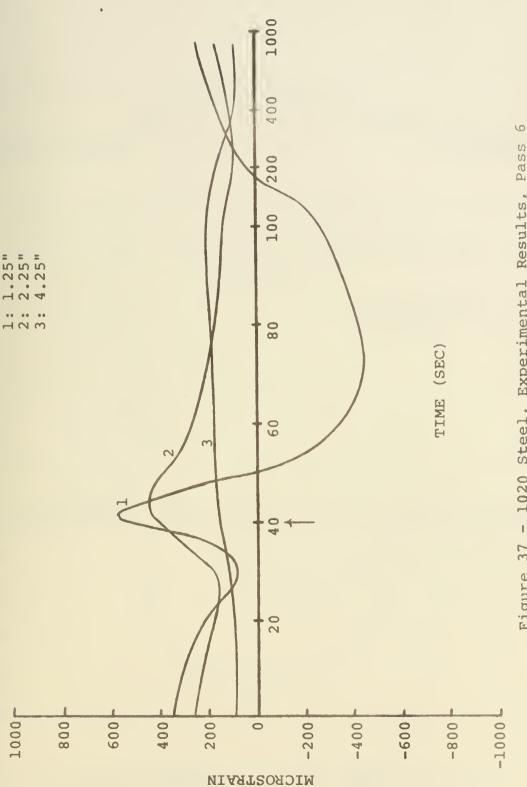




MICROSTRAIN

ហ Pass 1020 Steel, Experimental Results, Figure 36





- 1020 Steel, Experimental Results, Figure 37



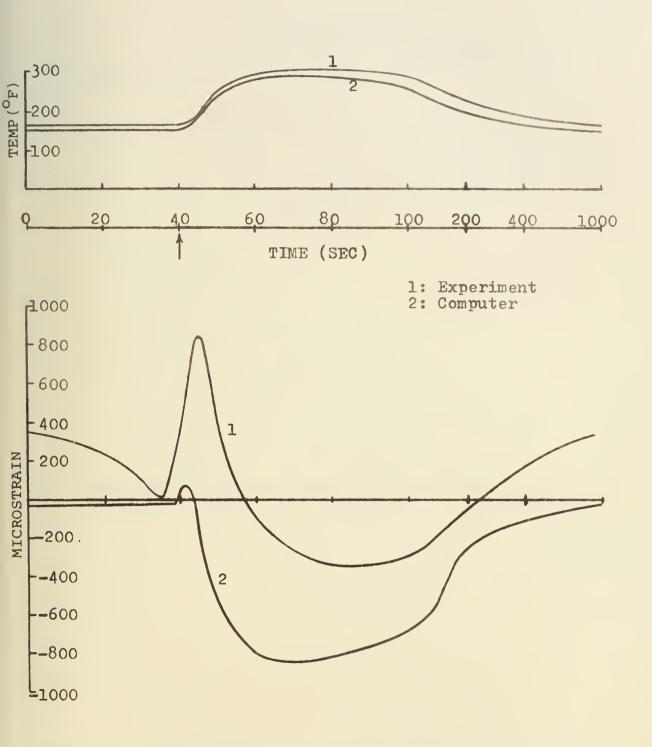
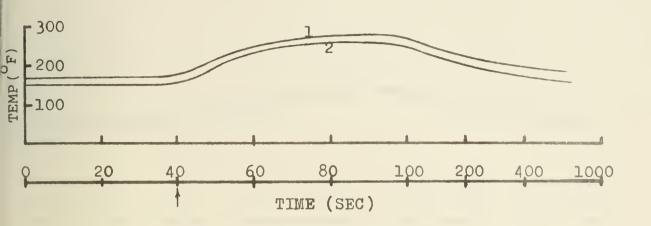


Figure 38 - HY-130 Specimen II, 1.0", Temperature and Strain Analytical Comparison, Pass 3





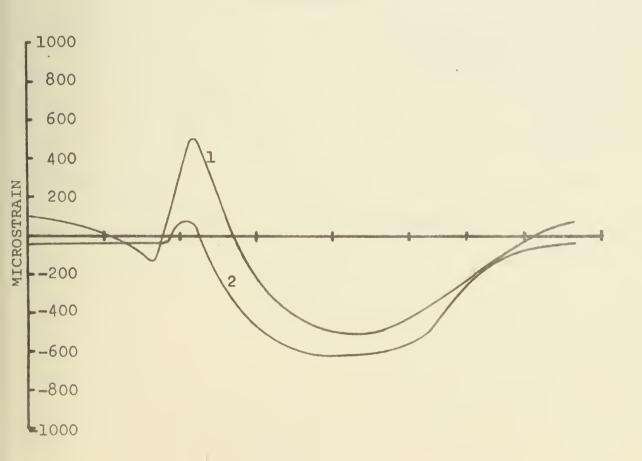


Figure 39 - HY-130 Specimen I, 1.25", Temperature and Strain Analytical Comparison, Pass 3



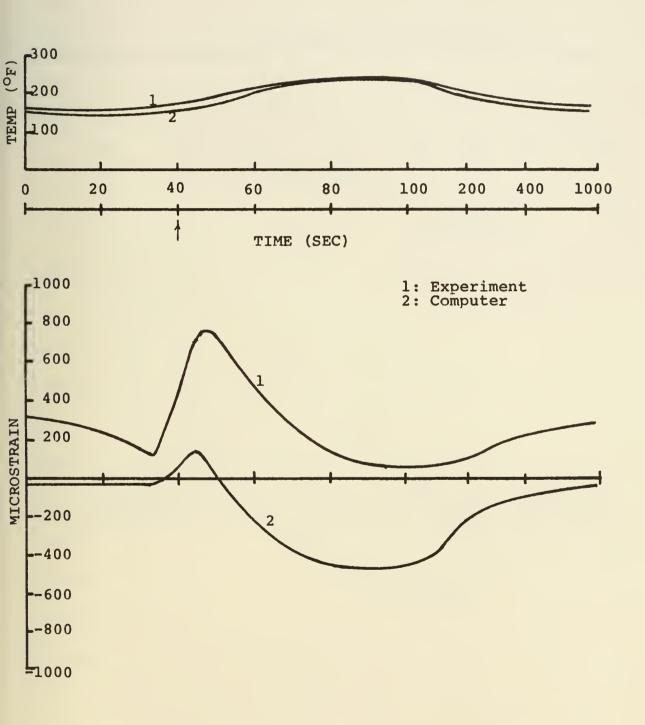
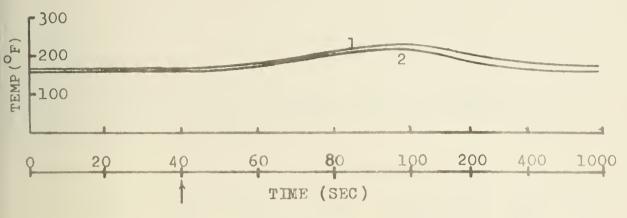


Figure 40 - HY-130 Specimen II, 1.5", Temperature and Strain Analytical Comparison, Pass 3





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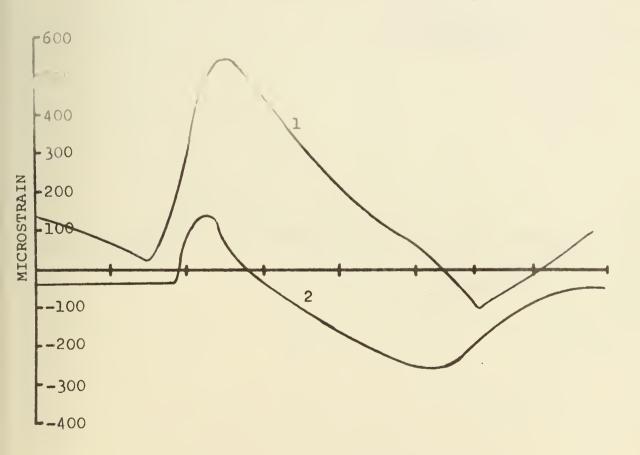


Figure 41 - HY-130 Specimen II, 2.0", Temperature and Strain Analytical Comparison, Pass 3



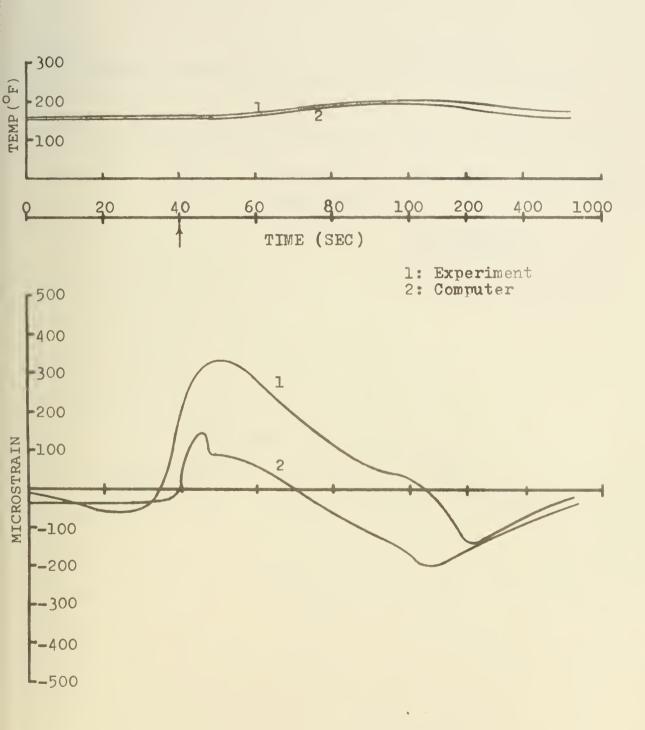
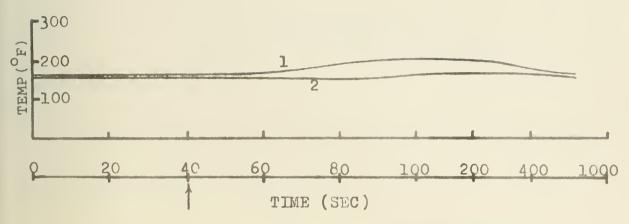


Figure 42 - HY-130 Specimen I, 2.25", Temperature and Strain Analytical Comparison, Pass 3





1: Experiment
2: Computer

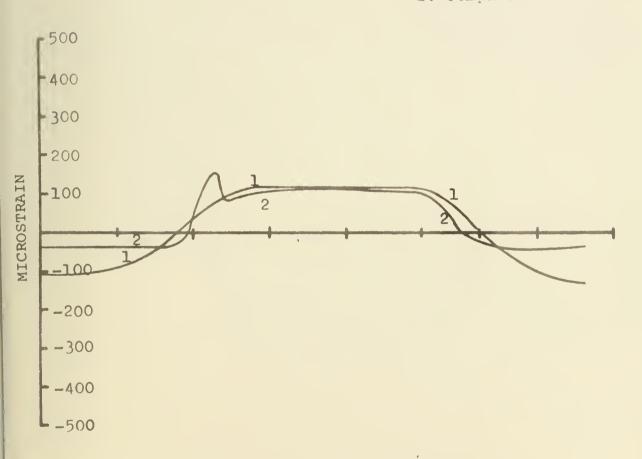
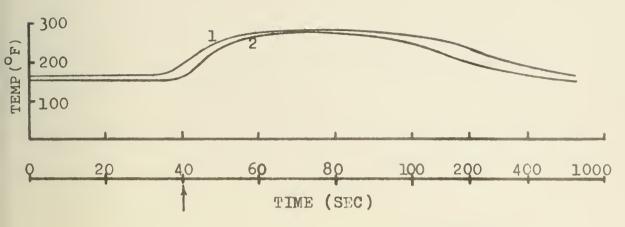


Figure 43 - HY-130 Specimen I, 4.25", Temperature and Strain Analytical Comparison, Pass 3





1: Experiment
2: Computer

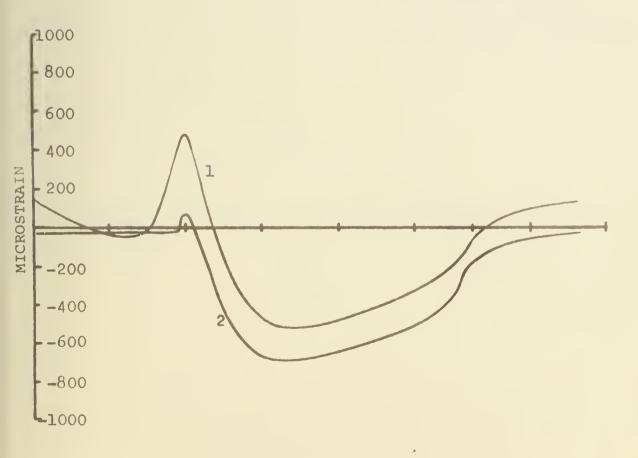
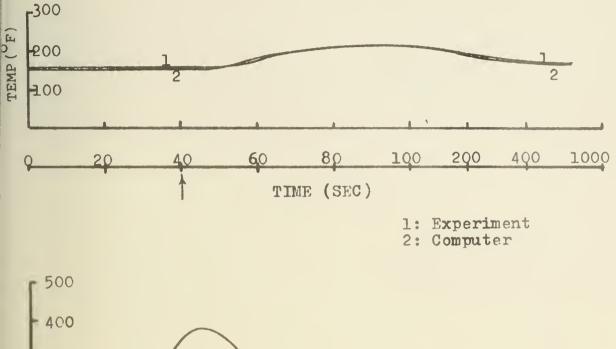


Figure 44 - 1020 Steel, 1.25", Temperature and Strain Analytical Comparison, Pass 3





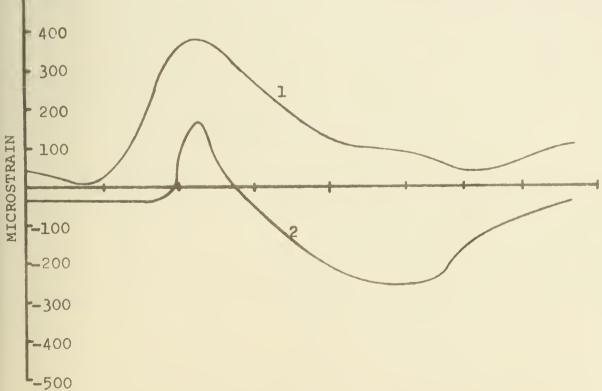


Figure 45 - 1020 Steel, 2.25", Temperature and Strain Analytical Comparison, Pass 3



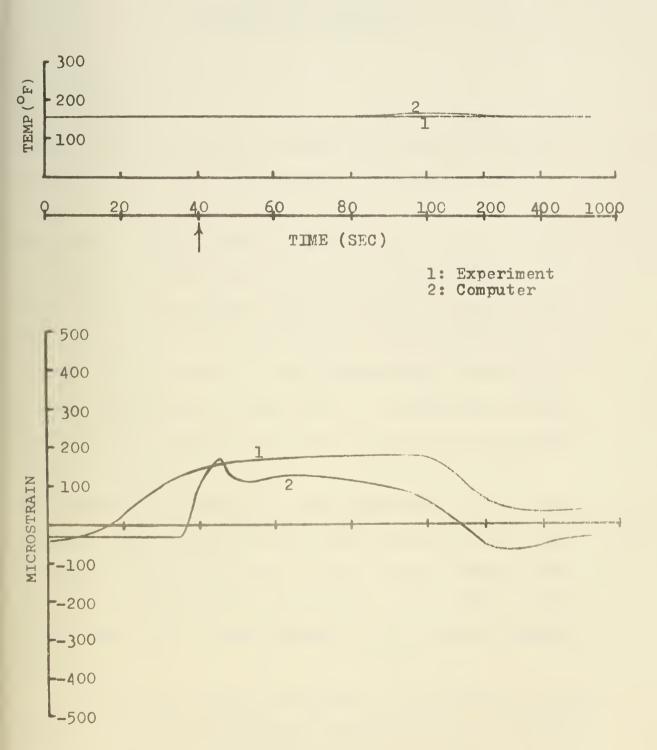


Figure 46 - 1020 Steel, 4.25", Temperature and Strain Analytical Comparison, Pass 3



CHAPTER V

DISCUSSION OF RESULTS

A. HY-130

In reviewing the results for HY-130, Specimen I shows almost identical results for each pass except for pass 2. After welding pass 1 on Specimen I, longitudinal cracks appeared along the fusion line between the bead and the base metal. They did not extend the entire length of the weld, but did exist in the vicinity of the instrumentation. This is the likely reason that the curves for pass 2 have not quite reached the characteristic shapes shown for passes 3-6. No cracks in the weld appeared following any passes except pass 1 on Specimen I. On Specimen I, where the measured strain at 1.25" from the weld line for passes 2 and 4 does not reach compressive strains as large as for passes 3, 5, and 6, it is felt that this is due to the slight movement of the arc from the prescribed weld line in order to fill the groove. As the arc was further from the points of measurement for passes 2 and 4 than for the other passes, the maximum temperature and strains reached were lower.

During the welding of Specimen II, no cracking occurred after any of the passes and the curves for strain measured at 1.0", 1.5", and 2.0" from the weld line exhibited a



characteristic shape immediately with pass 2, as shown in Figures 27 through 31. Great care was taken to fill the groove with minimal movement of the arc away from the center of the weld line. It is thought that this contributed to the relatively small variation in maximum tensile and compressive strains from one pass to the next.

Very interesting results occurred at 0.6" from the weld line on Specimen II, as shown in Figure 32. location was the closest point of measurement to the arc and the first notable observation is that the strains which exist between passes reach very high levels of tensile strain. These strain levels are approximately four times the interpass strain levels measured at 1.0" from the weld line. The second notable aspect of the curves is the rapidity in which the strain changes from a smoothly decreasing tensile strain to a high tensile peak and then returns to a smoothly decreasing tensile strain for passes 2, 3, and 4 (not shown). This entire change takes place in less than half the time and covers a much larger total strain change than that measured at any other transverse position. Following these strain movements, pass 5 shows no tensile peak at all but rather the strain starts at a high tensile strain level, reaches a minimum, and returns to a high tensile strain level. As stated in the previous



section, data for pass 6 is unreliable due to the temperatures greatly exceeding the maximum allowable for the strain gage.

This behavior at 0.6" from the weld line resembles that reported by Klein [2] in his study on 3/4" thick HY-130 plate. He reported two tensile peaks at points 1.0" or closer to the weld line. The differences between these results and those of Klein are most likely caused by the fact that his specimens were highly restrained whereas the specimens in this study were unrestrained. Klein [2] attributes this behavior to the possibility that precipitates form in the fusion zone and weld metal upon solidification which will cause high tensile strains in the metal near the weld line. Stoop and Metzbower [16] recently reported that the microstructure in the heat affected zone of GMA weldments of HY-130 consisted of coarse grained Bainite close to the fusion zone and autotempered Martensite plus ferrite further away from the fusion zone. Outside the heat affected zone, the base metal remained tempered Martensite. More will be said on this later.

B. <u>1020 Steel</u>

The results for 1020 steel closely resemble those for



HY-130 in terms of general shape of the curves of strain versus time. During welding of the first pass, there were areas of incomplete fusion and porosity. The second pass resulted in a complete, high quality bead. It is thought that the results shown for pass 2 reflect the low quality weld bead on the first pass and the results for the following passes show the characteristic strain behavior of a good weld in 1020 steel. The results measured at 6.25" from the weld line showed very little strain movement and are deleted from the figures.

C. Analytical Comparison

Figures 38 through 46 compare experimental results for temperature and longitudinal strain with one-dimensional computer program predictions for temperature and longitudinal strain. The results for pass 3 were arbitrarily chosen as they are entirely typical of the comparisons for the other passes.

Immediately apparent upon looking at the figures is that the temperature comparisons are very good whereas the strain comparisons are not very good in most cases. In calculating the temperature, the computer program treats the temperature distribution around the moving arc as a two-dimensional heat conduction problem. It appears that



this approach is adequate to describe the temperature distribution in the plates. Of interest in the results is that the arc efficiency used for calculating the temperature distribution was the same for both HY-130 and 1020 steel. This supports the contention that arc efficiency is only a function of the welding equipment used and not a function of the material being welded.

In analyzing strains, the one-dimensional program assumes that the longitudinal strain is only a function of the transverse distance from the weld line and the transverse strain as well as the shear strain are assumed to be zero. In fact, the transverse strains measured were not zero and for distances from the weld line of up to approximately one inch, the transverse strains were of the same order of magnitude as the longitudinal strains. transverse distances of approximately two inches, transverse strains are greatly reduced, but still significant. Only at greater transverse distances do they become relatively insignificant. It is thought that the presence of these transverse strains accounts for the poor comparisons between the experimental results and the one-dimensional program predictions because the assumptions used in calculating the longitudinal strains are not valid in these one inch thick plates. However, it can be seen that the



results for 4.25" in both the HY-130 and 1020 steels agree more closely than for points closer to the weld line.

This appears to be due to the absence of any significant transverse strains this far from the weld line.

To summarize the computer results, treating the temperature distribution as a two-dimensional heat conduction problem is shown to be an adequate method to use in thick plates. However, in calculating longitudinal strains, the one-dimensional program is only accurate when there are insignificant transverse strains.



CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

In summary, the results of these experiments indicate that the following conclusions can be made.

- (1) The use of electric resistance strain gages is an inexpensive, accurate, and convenient method of measuring transient thermal strains which occur during welding.
- (2) The strain system which exists close to the weld line in HY-130 is extremely complex and not well understood. The strain results of this study at 0.6" from the weld line of an unrestrained butt weld tend to support the existence of the secondary tensile peaks in restrained butt welds as reported by Klein [7]. This behavior is not evident at distances greater than 1.0 inch from the weld line.
- (3) The MIT computer program for the one-dimensional analysis of thermal stresses and metal movement during welding, which treats the temperature distribution surrounding the arc as a two-dimensional heat flow problem, accurately predicts the temperature distribution in one inch thick HY-130 and low carbon steel plates.
- (4) The existence of large transverse strains invalidates the assumptions made by the one-dimensional computer



program in calculating the longitudinal strains close to the weld line in thick plates. Therefore, the usefulness of the one-dimensional program for predicting longitudinal strains in thick plates is very limited.

changes occurring in the base metal near the weld as the arc goes by is validated by the results of this study.

Figure 47 shows the longitudinal strain field for HY-130 at times thirty seconds before the passage of the arc, during the passage of the arc, and ten minutes after the passage of the arc for pass 3. These curves show that just before the passage of the arc, strains are small with compressive strains near the weld becoming tensile far away. At the moment of passage, most of the plate is in tension with metal near the weld line in compression.

Then, ten minutes after the passage of the arc, high tensile strains exist near the weld, changing to compressive strains at points further than approximately two inches.

The results of this study create the desire to continue the work on these specimen plates. Recommendations for further study include the following.

(1) Compare the results with the predictions of a two-dimensional analysis of thermal stresses and metal movement.



- (2) Conduct a residual stress analysis of the weld-ment.
- (3) Conduct a metallurgical characterization study of the weldment to complement the study by Stoop and Metzbower [14].



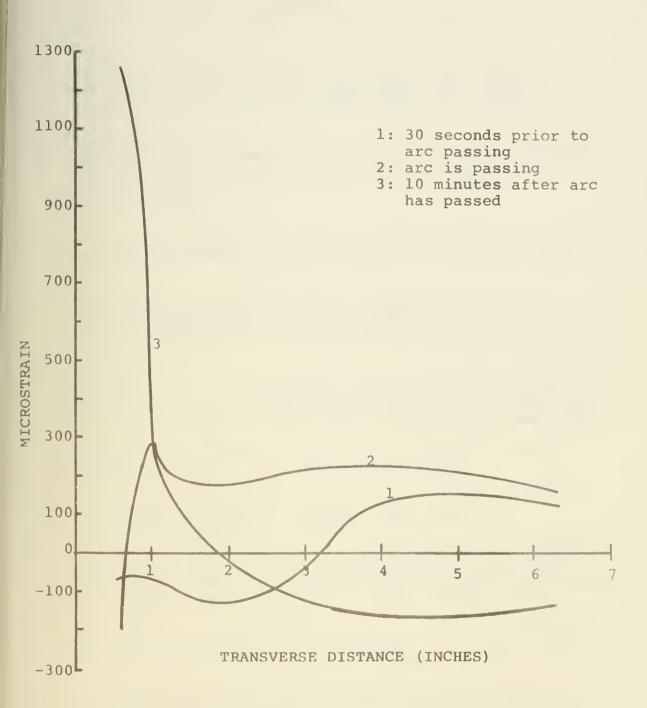


Figure 47 - Longitudinal Strain Field in HY-130, Pass 3



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APPENDIX

Analytical Predictions for HY-130 steel are presented.

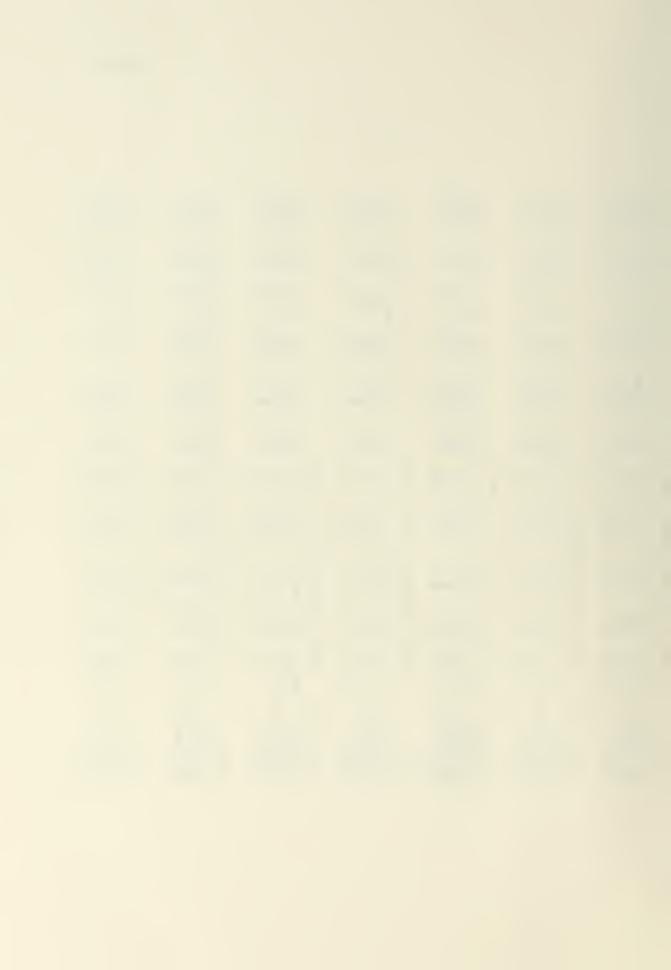


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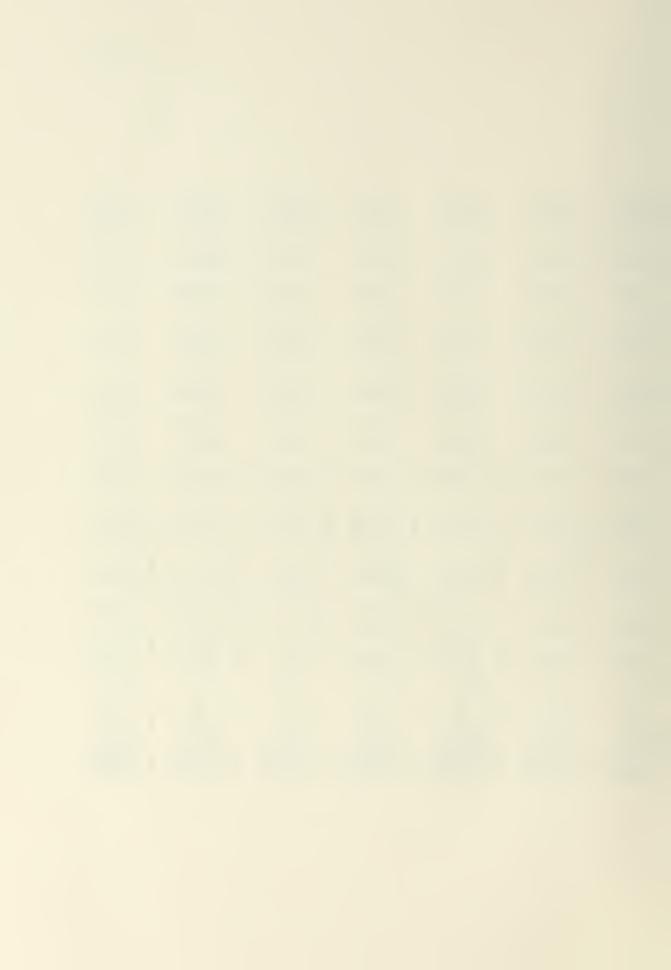
12.000		150.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	156.00	000.00 -0.00 0.0 0.0 0.00 0.00 0.00	15.0.00 - 6.00 0.95.0 - 6.00	303-9- 956-0 0-3 000-0-	150.00 -6.00 0.0 0.00 -0.00 -0.00
9.400		150.00 0.00 0.00 0.00 0.00 0.00 0.00	00.00	155.30 0.0 0.0 0.0	1; v . v . v . v . v . v . v . v . v . v	15C.CO 0.0 0.0 0.0 0.0	150.00 -c.c0 0.0 0.0 0.0 -0.00 -0.00
7.200		153.00 0.00 0.00 0.00 0.00 0.00 0.00 -C.CUÖ	30.00- 30.00- 30.00- 30.00- 30.00- 30.00-	150.00 -0.00 0.0 0.454 -0.00	700 700 700 700 700 700	156.05 -0.333 6.7 0.554 -0.330	150.00 10.00 0.0 0.0 0.45# 0.45#
77 (10		154.00 0.00 0.00 0.00 0.00 0.00	150.00	150.00	150.00 -0.030 0.00 -0.954 -0.030	150.09 - 0.000 9.9 0.954 - 0.000	150.00 - C.00.0 - 0.0 - 0.0 - 0.00.0
2.250		000000000000000000000000000000000000000	150.00 0.00 0.00 0.0	155.30 6.00 0.0 0.0 0.05 0.05 0.00	700.00 700.00 700.00	150.00 0.00 0.00 0.00 0.00	150.03 0.00 0.0 0.454 0.034
2.004		150.00	156.00 -0.00 0.0 0.0 0.0	150.00 -0.00 0.0 0.0 -0.056	150 000 000 000 000 000 000	159.00 - 0.00 0.00 0.00 0.00 - 0.00 - 0.00	150.00 -0.00 -0.00 -0.00 -0.00
1.500		1 PASS 0.00 0.00 0.00 0.00 0.00	156.00 0.0 0.0 0.0 0.0	1 FASS 150.00 0.0 0.0 0.954	gen	150.00 0.00 0.00 0.00 0.00	150 100 100 100 100 100 100 100 100 100
1.240		150.CG -0.000 0.0 0.054 -0.056	15C.Cu -0.000 0.0 0.954 -0.000	150.00 -0.000 0.0 0.0 0.0 0.00	150.00 -0.000 0.00 0.000 -0.000	150.00 -0.000 0.954	150.33 -C.003 3.0 0.954 -0.000
966*0			3				150.00 150.00 0.0 0.0
0.600	2		153.00 -3.000 0.0 0.0 0.954 -3.003	150.000 -0.000 -0.000 -0.000 -0.000	LNVCLVZ NULTI-FASS CC 156.00 156.30 0.0 0.0 0.0 0.0 954 0.954 0.954 0.954 0.954	LHVOLVE HULII-FASS 04 150 06 150,30 350 0.03 0.0 954 0.954 0.954 010 -0.000 0.0	150.00 150.00 -0.00 0.00 0.00 1.000
3.5	T= 10.00	156. CC 150. 0.0 0.0 0.3 0.3 0.3 0.3 0.3 0.3	150.00 0.0 0.0 0.0 0.0	170.00 1.0.00 1.0.00 1.0.00 1.000 1.	155. CC 0.0 0.0 0.954 0.954	150.00. -0.000 0.0 0.0 -0.0 -0.0	1550.00 -0.00 -0.00 -0.00 -0.00 -0.00 -0.00
	HEAT SOURCE AT	O O O O O O O O O O O O O O O O O O O	1.00 TUBE SEATS SIRALS TRAIS	TIMET 2.00 TEMPERATURE BECH. STRAIN FORE STRAIN STRESS	TIMES 3.03 TERRIBATURE MICH. STRAIN TOFAL STRAIN STRIS	TINER 4.00 TEXPESATURE RECH. SIRAIN PLASIIC SIRAIN TOTAL SIRAIN STRESS	TIRES 5.03 FROME STATA PLASELC STAILA TOTAL STRAIR STRESS
	HEAT SO	TINER 0.0 TEMPSHATURE EECH. S.HAIN PLASTIC STRA TOTAL STRESS	TIRE# 1.03 TEMPERATURE MFCH. SIPAIN PLASIIC SHAIN TOTAL SIRAIN STREIS	TINET TEBPERATURE BECH: STRAIN PLASTIC STRA TOTAL STRAIN STRESS	TIMES 3.0 THE SALIPE MICH STRAIN PLASIEC STRAIN TO FAL SERAIN STRAIN STRAIN	TINE# 4.0 TEXPERATURE RECH. SIRAIN PLASTIC SIRAIN TOTAL SIRAIN SIRESS	TIRES TEMPERATURE RECH: STRAIA PLASINCAL SANAMA TOTAL SANAMA STRESS



	150.03 6.00 0.954 - 0.000	156.67		153.03 -9.662 9.0 3.952 -3.953		153.03 -3.036 -0.036 -3.636 -3.475		15c. CC -0.00J -0.00J -0.94c -0.225		153.00 - 6.623 0.0 0.031 - 9.673		150.00 -0.045 0.50 -1.540
	150.03	153.64 -0.330 0.05 0.954		150.03		150.00.00.00.00.00.00.00.00.00.00.00.00.0		150.Cu -0.003 0.951 -3.076		153.00 -C.CC & 0.00 -0.229		153.00 -3.015 0.5 0.93H -0.455
	150.00	15C.CC 0.00 0.00 0.00 0.00 0.00		150.50		153.33 0.304 0.953 0.953		150.00		153.00 C.C.7 0.0 0.961 0.216		150.00
	150.02	150.00 0.00 0.00 0.00 0.00 0.00 0.00		150.03 0.032 0.0 0.05 0.051		155.33		150.00 0.00 0.00 0.962 0.256		150.03 0.026 0.0 0.479 0.763		150.03
	153.03	150°CC 0°000 0°C 0°956 0°956		150.33 0.00 0.956 0.076		150.00 0.025 0.0 0.478 0.132		150.63 0.013 0.966 0.378		150.00 0.00 0.00 0.992 1.132		150.00 3.070 6.0 1.024 2.255
	151.00	15C.30 0.300 0.950 0.950		150.00 0.00 0.00 0.00 0.00 0.00 0.00		150.33		15C.00 0.013 C.967 0.393		150.00 0.00 0.00 0.00 1.17d		153.00
1 PASS	150.03	180.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	1 PASS	152.03	1 PASS	156.00 0.328 6.0 3.381 3.425	1 PASS	150.01	1 PASS	150.05	1 PASS	150.14 U. J84 C. U 1. J39 Z. 504
EPFECT	150.06	150.00 0.000 0.000 0.000 0.005	E F F C T	150.03 C.CG3 0.3 J.957 J.049	EFFECT	15C.02 0.029 0.0 0.943 0.853	EPPSCI	150.08	EFFECT	150.30	14 53 64 64 64	151.31
ZULII-PASS	151.30	150.00 0.000 0.000 0.000 0.000 0.000	TI-PASS	150.02	TI-PASS	150.11 0.329 6.3 0.904 0.865	TI-PASS	156.85	TI-FASS	152.79	AULTI-PASS	156.99
	150.30 -0.030 6.0 0.954 -0.003	LUVOLVE HULTI-FASS 06 150.02 150.00 021 0.000 0.000 954 0.954 0.954 619 0.001 0.005	INVOLUE NULTI-PASS	150.26 0.002 0.0 0.957 0.45	INVOLVE BULTI-PASS	153.16 0.013 0.945 0.297	INVOLVE RULTI-PASS	165.19 -0.00 0.01 -2.60d	INVOLVE RULTI-FASS	194.23	IUN ZULCUNI	247.50 -0.517 0.0 1.050 -15.241
INVOLVE	150.05	153.0d -3.321 0.3 0.3 0.95w -0.619	INVO	206.58 -0.389 0.0 0.0 0.957 -11.511	OAMT	798.05 -5.115 -0.924 0.708	DANI	2500.00 -17.654 -17.654 0.971	CARI	2503.33 -17.614 -17.614 1.906 0.3	ENVO	17.568 -17.568 -17.568 -17.588
6.03	FRALM FRALM FRALM	7.3.3 FURE FRAIN FRAIN	8.J3	TURE FRAIN STRAIN FRAIN	60.6		10.03	3	11.33	28	12.00	X
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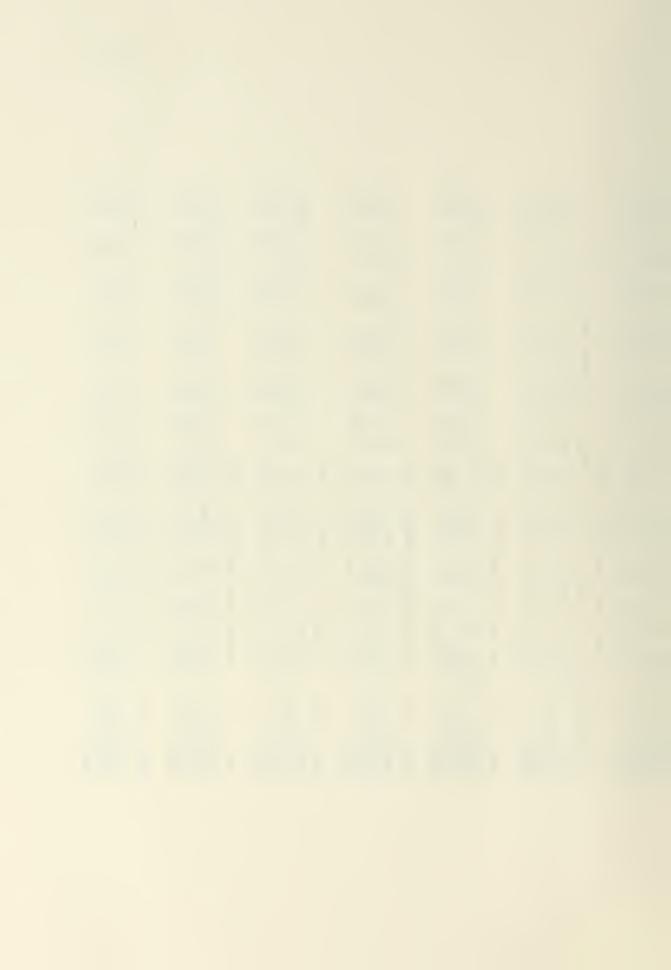
	150.00 -0.068 0.068 0.846 -2.017		153.33 -0.068 3.0 0.866 -2.608		150,00 -0.104 0.450 -3.085		156.00 -0.117 0.0 0.847 -3.470		150.00 -0.127 0.0 9.827 -3.762		150.00 -3.136 0.0 2.818 -4.036		150.00 -0.143 0.0 0.0 -4.253
	150.00 -0.323 7.0 0.931		150.30 -0.030 0.0 0.924 -0.680		150.03 -C.035 0.0 0.919 -1.018		156.00 -0.019 0.015 -1.163		-0.042 0.0 0.0 0.911		150.00 -0.045 0.0 0.939 -1.544		150.03 -3.347 0.0 0.900 -1.439
	152.66		153.33 C.023 C.982 C.982		150.00 0.034 0.0 0.088		156.00 0.034 0.036 0.992 1.143		150.00 0.042 0.0 0.0 1.255		150.03 0.345 0.0 0.994 1.351		150.00
	150.00		153.03 C.103 U.0 1.054 2.972		150.00		150.00 0.134 0.0 1.087 3.989		150.00 0.146 0.0 1.100 4.353		150.00 C. 157 3.0 1.110		155.00 0.166 0.0 1.119 4.932
	156.03		153.01 6.14B 0.0 1.104		153.01		150.03 0.198 0.0 1.152 5.889		150.35 C.216 0.0 1.173 6.433		150.13 0.231 0.231 1.186 6.882		150.16
	150.01 3.119 0.0 1.073 3.538		153.03 6.154 0.3 1.198 4.501		150.06 0.182 C.0 1.117 5.428		150.13 0.205 0.0 1.166 6.113		150.24		153.41		151.00 0.244 0.0 1.269 7.348
1 PASS	150.37 0.126 0.0 1.002 3.746	1 PASS	151.22 C.159 0.3 1.120 4.701	1 PASS	152.27 0.1H2 0.0 1.151 5.410	1 PASS	151.77 0.197 0.0 1.176 5.855	1 PASS	155.77 0.204 0.3 1.197 6.063	1 PASS	156.22 1 0.204 0.0 1.214 6.075	1 PASS	161.07
EFFECT	152.93 0.113 0.0 1.087 3.366	EPFECT	155.58 0.134 0.0 1.126 3.996	EPPECT	159.32 0.141 0.0 1.158 4.167	EFFECT	164.05 0.135 0.0 1.184 3.998	EPP ECT	169.52 0.118 0.0 1.266 3.515	EPFECT	175.46 C.095 C.C 1.224 2.823	EPPECT	181.62 0.068 0.0 1.239 2.004
HULTI-FASS	164.30 0.042 0.3 1.091	TI-PASS	173.53 0.617 0.3 1.132 0.512	AULTI-PASS	184.61	NULTI-PASS EPPSCT	196.31 -0.082 0.0 1.192 -2.416	TI-PASS	207.79 -0.140 0.0 1.215 -4.152	KULTI-PASS	216.56 -0.198 (.0 1.233 -5.859	TI-PASS	228.33 -0.252 0.0 1.249 -7.447
	278.28 -0.765 0.0 1.099 -22.431	INVOLVE RULTI-PASS	313.75 -C.963 0.0 1.142 -28.099	INVOLVE NUL	124.16 0.0 0.0 1.177	INVOLVE MUL	350.35 0 -1.197 0 0.0 1.205 -34.733	INVOLVE KULTI-PASS	361.23 -1.256 0.0 1.229 -36.383		106.30 -1.240 (.0 1.248 -37.334	LAVOLVE KULTI-PASS	372.64 -1.306 0.0 1.265 -37.785
LNVOLVE	2500.30 -17.515 -17.515 1.110	IAVO	2530.30 -17.469 -17.469 -17.469 -17.60	OART	2500.00 - 17.431 - 17.431 1.194 0.0	IAVO	25000.00	INVO	2530.30 -17.375 -17.375 1.250 0.3	INVCLVE	2550.00 - 17.154 - 17.154 1.271	Tavo	2500.00 -17.336 -17.336 -17.336 0.0
TIME= 13.39	TEMPERATUEZ MECH. SIKAIN PLASILC SIRAIN TOTAL SIRAIN STRESS	TIRE= 14.00	TERPERATURE MECH: STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIRE= 15.60	ABECH. STRAIN BLASTER STRAIN TOTAL STRAIN STRAIN STRAIN	TinE= 10.00	TEMPERATURE MECH. SIBALN PLASIC SERAIN TOTAL SIRAIN SIRESS	TIME: 17.00	TERPENATHAE RECH. STRAIN PLANTIC STRAIN TOTAL STRAIR STRESS	TIME= 18.00	TENPERATURE RECH. STHAIN PLASILC STRAIN TCIAL SYRRIN STRESS	TIME= 19.30	TENPEARTHEE RECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS



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150.00 0.01 0.00 0.00 0.00 0.00 0.00 0.0	153.CC 0.117 3.C 1.C71 3.487	150.00 0.127 0.0 1.06C	153.00 C.123 0.0 1.677 3.674	150.00 0.123 0.0 1.071 3.659	153.00 9.122 0.0 1.075 3.619	150.00 0.01 1.07 1.07 1.07
150.00 -6.049 0.0 2.935 -1.462	156-00 0-117 0-01 1-071	150.33 0.127 0.0 1.000 3.773	150.00 0.123 0.0 1.077 3.674	156.¢¢ 0.123 0.¢ 1.¢/7 3.659	150.00 0.122 0.0 1.075 3.619	150.00 0.10 0.00 1.07 3.04 3.04
150.00 3.051 3.051 1.204 1.506	156.00 0.117 0.21 1.671	150.00 6.127 0.0 1.060 3.773	150.00	150.00 0.123 0.0 1.011 3.659	150.30 6.122 0.0 1.075 3.619	150.00 0.119 0.0 1.073 3.543
150.33 0.3 0.3 1.127 5.157	150.00 0.117 0.01 1.071 3.436	150.02 0.121 0.0 1.090 1.770	150.10 0.123 0.0 1.077 3.653	150.35 0.121 0.0 1.077 3.588	151.15 0.114 0.0 1.075 3.386	152.00 0.105 0.0 1.073 3.138
150.26 0.254 0.0 1.210 7.566	1623.76** 155.49 0.00 1.071 2.372	165.39 0.0 1.680 0.733	174.55 -6.045 0.0 1.077 -1.337	181.89 -0.097 0.0 1.077 -2.864	187.01 -0.134 0.0 1.075 -3.561	190.31 -0.159 -0.0 1.074 -4.716
151.47 0.250 0.3 1.223 7.632	2 C C C C C C C C C C C C C C C C C C C	176.60 0.0 1.083	-0.138 -0.138 -4.079	195.22 -3.193 0.0 1.377 -5.618	199.56 -0.222 0.0 1.075 -6.559	201.50 -0.240 0.0 1.073 -7.059
-	03 231 197.40 -0.214 1.021	2 13. 14 0. 14.8 1.080	1 PASS 227.16 -0.416 6.0 1.377	230.11 -0.437 0.0 1.077 -12.900	229.90 -0.437 0.0 1.075	1 PASS -226.05 -0.427 1.073
	232 232 -0 -0 -1	248.46 -0.566 0.0 1.080	3 5 5	250.14 -0.582 0.0 1.077	246.29 -0.555 J.075 -16.346	241.62 -0.524 0.0 1.073
236.88 -0.301 0.0 1.262 -4.800	TO.FR= 178.30 -0.793 1.071 1.071	282.84 -0.817 0.0 1.080 -23.939	277.72 -0.783 0.0 1.077	276.98 -0.727 0.0 1.077	262.06 -0.07C 0.0 1.075 -19.685	254.46 -0.517 -0.517 -1073
375.02 -1.311 0.0 1.279 -37.894	11 VOLVE KULTI-PASS UE J= 1 TM, TU, IN= 03 360, 24 278, 30 157 1, 406 -0.793 157 1, 071 1,071 700 -40, 743 -23, 256	INVOLVE RULTI-PASS 62 335.39 282.84 437 -1.239 -0.817 583 0.0 0.0 080 1.083 1.080	314.28 -1.054 0.0 1.077	297.02 -0.926 0.0 1.077	LVE MUI 282.76 -6.822 0.0 1.075 -24.075	276.77 -0.736 -0.03 1.073
2550.00 -17.322 -17.324 1.303 0.0	1899.03 363.24 2 14.06 11.071 1.071 1.071 3.700 -40.743 -	INVOLVE RULT 1664.62 335.39 - -10.437 -1.209 -12.583 -0.0 1.080 1.080 7.854 -35.151	712.	129. 359	323.68 -1.126 -5.724 133.841	256.35 -0.587 -5.287 -5.483 1.073
<u>™</u>	N N N N N N N N N N N N N N N N N N N	0 #	TEMPERATURE SC. CO. TEMPERATURE RECH. SITAIN PLASIEC STRAIN STRAIN STRAIN STRAIN	TIRE 60.00 TEMPERATURE MECH. SIRALN PLASIEC SIRALN TOTAL SILALN STRESS	TIRE= 70.00 TERFERATURE MECH. SINAIN PLASIAC STRAIN STRESS	TIME GO.OU TENLUNALUNE MECH. SIMALN PLASFIC JEVIN TOTAL SIMALN STRESS
TELBOTALUME RECH. STANIE PLASTIC STAN TOTAL STRAIN STRESS	THEM SONS NO. TENN PERMITTER NO. STRAIL PLASTAL STRAIL STR	TIMES 40.3 TENFERATURE MECH. SIRAIN PLASTIC SIRAIN STRESS	TEMPER TEMPER PLASSIE TOTAL STRESS	TERPERATURE RECH. SERAL PLASEC SERAL TOTAL SERAL STRAIL STRAIL STRAIL STRAIL STRAIL STRAIRS	TIME 10.0 TEMPERATURE MECH. SIMAIN PLASILC STRA TOTAL STRAIN STRESS	TIME - 40. TEXTURATURE MECH. SINAL PLASTIC - FINAL TOTAL SINAL SINAL SINAL SINAL SINAL

INVOLVE BULTI-PASS EFFECT 1 PASS

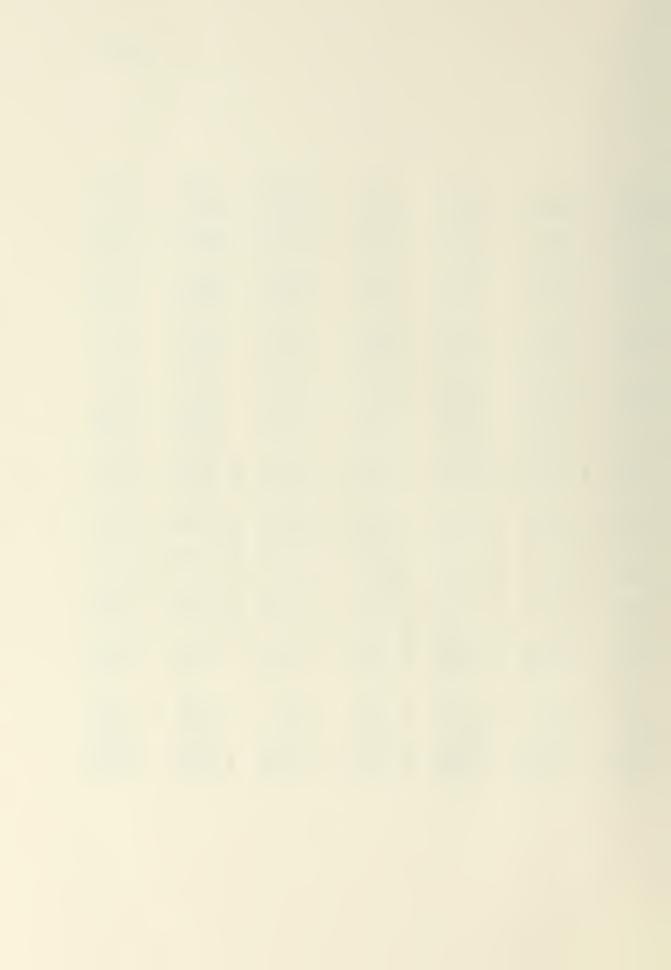
TIME= 20.03



150.cc 0.116 0.0 1.J70 1.453	150.00 0.0 1.060 3.354	153.30 0.0 0.0 1.34.9 2.620	156.30 0.074 0.032 1.032 2.327	153.00	150.01	150.03 0.042 0.042 1.237
150.00 0.116 0.0 1.070 3.453	150.00 0.113 0.0 1.006 1.354	153.03 C. C95 C. O 1.048 2.620	150.01 0.078 0.0 1.032 2.325	1.500	150.12	150.22 0.04 0.0 0.195 1.200
150.C0 0.116 0.0 1.070 3.452	150.01 0.0 0.0 1.056.1 3.354	153.12 0.0 1.348 2.756	150.45 0.075 0.0 1.032 2.236	151.11 0.0 1.018 1.686	251 200 200 200 200 200 200 200 200 200 20	2000 2000 2000 2000 2000 2000 2000
153.01 0.036 0.0 1.373 2.843	154.09 0.085 0.1.066 2.525	158.73 0.0.35 0.0 1.048 1.035	161.01 0.03 6.0 1.032 0.098	161.36 - C. C. 13 - C. O. 0 - U. 198	160.69	15%.60 -0.02% 0.03% 0.03%
192.24 -0.176 0.0 1.370 -5.237	193.17 -0.10. 0.0 1.000	1900 uu C 0 184 1 0 2 u d	184.03 -0.156 0.0 1.032 -4.631	177.80 -0.127 0.0 1.018 -3.765	172.46	366.09 -0.082 0.0 0.0 0.995 -2.433
292.61 -0.249 -0.249 -1.070 -7.359	202.49 -0.251 0.0 1.056 -7.431	195.47	187.36 -0.179 0.0 1.032 -5.317	179.94 -0.142 -4.204 -4.204	173.84 -0.112 -0.012 -3.321	10.00 0.0 0.0 0.493 - 2.648
1 PASS 225.37 -3.410 0.0 1.070 -12.112	22. -0.1.1. -0.1.1. -0.1.1. -0.1.1. -0.1.1. -0.1.1. -0.1.1. -0.1.1.	~	193.54 -0.223 0.0 1.632 -6.597	183.82 -6.169 0.0 1.018 -5.003	176-42 -0.129 0.0 1.306 -3.842 1 PASS	170.78 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
236.74 -0.492 0.0 1.070	31.92 1.92 1.666 13.583	-0.331 -0.331 -0.6 1.048 -9.774	EPPEC1 196.23 -0.242 1.032 -7.154	185.49 -0.18C 0.0 1.018 -5.347 EFECT	177.47 -0.137 0.0 1.006 -4.059	0.00
3 247.26 64 -0.568 70 1.07C	240.72 -0.524 0.0 1.066 -15.433	215.34	HULEL-LASS 29 1948-56 277 -0.254 0.0 0.0 642 1.032 203 -7.036 HULEL-PASS	186.91 0.0 0.0 1.01d 1.5.643	178-37 0.0143 0.00 1-006 -4-244 11-PASS	172.10 -v.110 0.0 0.245 -3.260
250.53 -0.664 -0.0	LHVCLVE RULTI-PASS EFFECT US 251.66 240.72 231.92 133 -C.003 -0.524 -0.40 HJS 0.0 0.0 Unh 1.66 1.66 1.66 517 -17.741 -15.433 -13.58	153.05 220.39 215.33 0.074 -0.340 0.1074 -0.340 0.1004 11.044 11.044 145.175 -11.645 -10.646	201.29 -0.277 0.0 1.042 -4.203	09 180.55 186.91 064 -0.262 -6.190 015 0.0 018 1.018 1.014 908 -5.979 1-5.640	01 179 41 170 37 052 -0.150 -0.143 845 C.0 0.0 056 1.006 1.006 552 -4.458 -4.244 1NVCLVE HULTI-PASS	172.78 -0.115 0.0 0.455 -3.403
264.20 -0.202 -4.952 1.070	145.05 251.65 244.72 2-0.133 -0.524 -	155.05 0.074 1.074 145.175	150.28 0.076 -4.805 14.5.28 145.28 145.28 145.28	159.09 6.064 -4.805 1.318 144.908	150.01 0.052 -4.8C5 1.005 144.562	150.00 0.042 -4.600 6.899
TERRET FOR 90.00 PLEASE PLEASE SITECH STARTS TOTAL SITALS STARTS STARTS STARTS STARTS	TIME 100.33 TERPERATURE RECH. S.RAIR PLASIC STRAIN STRES.	TEAPTHURE TEATHURE TEATHURE TOTAL STRESS STRESS	TIME= 200.00 TERPESTURE FECH: STRAIN PLASSIC SFRAIN STREES STREES	TEMPERATURE MECH. STRAIN PLASIIC GIRAIN STRAIN STRA	TEMPERATURE SHALB PLASTIC STRALB TOTAL STRALB STRAL	The bands of the form of the f



150.06 0.033 0.0 0.407	150.10 0.625 0.6 0.5757	150.15 0.013 0.974 0.571	150.19 0.0 0.0 0.969 0.416	159.24 0.019 0.465 0.2045	150.27 0.006 0.0 0.961 0.175	150, 29 0, 003 0, 0
150.31 0.0 0.0 0.37 0.92	150.40 0.023 0.023 0.400	150.44 0.017 0.974 0.505	150.54 0.012 0.0 0.969 0.346	150.55 0.037 0.37 0.465	357.55 0.004 0.0 0.961 0.961	150.53 0.60 0.0 0.45 0.054
151.49 0.323 0.0 0.3 0.586	152.01 C.312 0.0 0.380	151.94 0.007 0.974 0.203	151.82 0.03 0.03 0.969	151.66 -C.073 0.0 0.965 -C.005	151.50 -0.002 0.0 0.961	151.11 -0.000 0.0 0.459 -0.125
156.38 -0.024 0.0 0.987 -0.712	157.19 -C.323 0.0 0.493 -0.602	156.11 -0.021 6.0 0.574 -0.637	155.14 -0.620 0.0 0.964 -0.587	154.40 0.014 0.965 -0.540	151.59 -0.017 0.0 0.461	152.99 -0.615 0.0 0.954 -0.462
164.57 -0.006 0.000 0.487 -1.973	161.75 -0.054 0.00 0.98J	159.46 -0.044 0.0 0.074 -1.323	157.66 -0.037 0.909 -1.100	156.20 -0.031 0.0 0.965 -0.926	155.33 -0.027 6.0 0.961 -0.790	154.38 -C.023 3.0 0.959
165.25 -0.071 0.0 0.947 -2.114	162.23 -0.057 0.057 0.980	154.83	157.92 -C.039 0.00 0.969 -1.151	156.39 -0.032 0.0 0.965 -0.964	155.17 -0.028 0.0 0.0 0.961	154.19 -0.024 0.0 0.959 -0.706
160.014 0.0174 0.947 -2.355	1 PASS 163.07 -0.063 0.00 0.140	1 PASS 166.43 0.05 0.05 1.517	1 PASS 158.16 0.00 0.00 1.402	156.72 -0.035 0.905 -1.031	155.42 -0.029 0.0	1 PASS 154.37 -0.025 0.095 -0.743
160.93 -0.043 0.987	16 4 2 - 4 2 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -	100.68 -0.053 0.074	158.54 -0.043 0.909	156.85 -0.036 0.0 0.965	155.51 -0.030 0.0 0.961 -0.888	1 4.45 -0.025 0.095 -0.758
AULTI-FASS 2 167.15 49 -0.000 81 0.987 1.7 -2.541	163.71 -0.368 0.980 -2.369			156.96 -0.056 0.965 -1.080		
200,0	104.C4 -0.070 0.0 0.963	INVOLVE AULTI-PASS 00 161.13 166.49 020 -0.056 -0.058 835 0.0 0.0 974 0.974 0.974 620 -1.053 -1.017	INVOLVE ZULTI-PASS 30 158.86 158.69 30 15.085 -0.344 445 0.989 0.909 473 -1.384 -1.309	157.09 -0.037 -0.037 -0.965 -1.106	INVOLVE HULTI-PASS 00 155.69 155.59 006 -0.031 -0.030 805 0.0 0.0 901 0.901 0.901	14VOLVE KULTI-PASS 33 154.51 005 -0.026 -0.026 005 0.03 0.03 959 0.959 0.959 162 -0.710
153.33 167 0.43 -0 -4.405 3 0.937 -0	156.00 0.026 -4.655 0.930	150.00 0.020 -4.805 0.974 143.620	150.00 0.015 0.015 -4.805 0.969	18 VC 15 U. CC 0. 011 -4. ECS 143. 350	150.00 0.005 0.908 -4.805 0.948	150.03 0.005 -4.405 0.959 143.162
TEMPLANTORE SECHOSTANTIN PLASTIC STANTIN TOTAL STANTIN	TERES 450.66 TERPSRALURE BECL. STRAIN TOTAL STRAIN STPPSS	TEMPERATURE NECH SIPAIN PLASIE SIMAIN TOTAL SIMAIN STRESS	TEMERATORE HECH. SERAIN PLANIC STRAIN TOTAL STRAIN STRESS	TERVERATURE RECENT STAIN STRESS SRAIN STRESS	TIME= 65C.00 TEMPERATURE RECH. STRAIN PLASTIC STRAIN TOTAL STRAIN SIRES	TIRL= 700.00 TEXTERNIA RECH. STRAIN PLASTIC JTRAIN TOTAL STRAIN STRESS



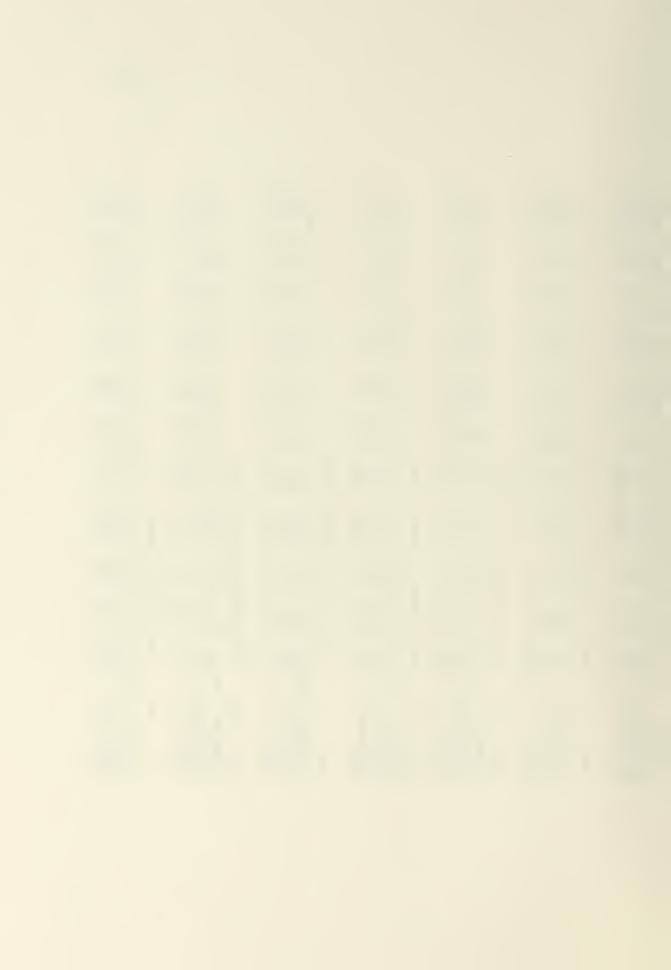
150.33 6.003 6.0 0.956 6.003	156.32 -0.002 0.0 0.554	156.32 -0.001 0.003 0.953 -0.049	150.31 -0.0 0.0 0.951 -0.132	150.13 -0.00 0.00 0.950 -0.160	150.22 -0.000 0.0 0.949 -0.191	157, 29 - 0, 006 6, 0 0, 949 - 0, 191
150.50 -9.00 6.6 0.95 -0.037	15C.47 -0.034 0.954 -0.083	8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	150.48 -0.00 0.00 0.451 -0.166	150.444 -0.00 0.0 0.00 -0.193	150.41 - 0.037 0.945 - 0.215	150.41
151.17 -0.000 0.000 0.950 -0.164	151.02 -0.037 6.6 0.954 -0.194	150.86 -0.337 3.0 3.853 -0.210	150.76 -0.057 0.0 0.951 -0.223	150.05 -0.000 0.3 -0.236	155.56 -0.30d 0.0 0.94y -0.246	150.56 -0.094 0.0 0.0 0.0 0.0
152.40 -1.014 0.0 0.456	152.66 -0.014 6.6 0.954 -0.404	151.70 -0.013 6.0 0.953	151.41 -0.012 0.0 0.3 451	151.17 -0.011 0.00 0.450	150.97 -0.011 0.0 0.049 -0.328	153.97 -0.011 0.0 0.949 -0.328
153.32 -0.020 0.00 0.956 -0.601	152.70 -0.018 0.0 0.954	152.26	151.80 -0.015 0.00 0.951	151.47 -0.013 0.0 0.950 -0.401	151.20 -0.013 0.0 6.949 -0.375	151.20 -0.014 0.0 0.949
153.43 -0.021 0.956 -0.617	152.76 -0.018 0.954	152.25 -0.016 0.0 0.953	151 -0.0 0.0 0.0 0.451	151.50 -0.014 6.0 0.950 -0.406	151.22 -0.0114 0.0 0.949	151.22 -0.015 0.0 0.949
153.54 -0.022 0.0 0.756 -0.645	152.87 -0.019 6.6 0.954	152.43 -0.017 0.453 -0.503	151.83 -0.015 0.0 0.951	1 CASS 151.54 -0.014 0.0 0.0 -0.416	1 PASS 151.26 -0.011 0.0 0.949	1 PASS 151.26 0.0 0.049 0.949
2FFECT 153.60 -0.022 0.956 -0.656	152.91 -0.019 0.0 0.954 -0.578	152.36 -0.017 0.0 6.953	151.92 -0.015 -0.05 -0.458	151.56 -0.014 0.05 0.05 0.420	151.27 -0.013 0.0 0.949 -0.390	151.27 -0.013 0.94 y
153.04 -0.322 6.3 0.956 -0.666	152 - 452 - 45 - 45 - 45 - 45 - 45 - 45 -	18 VOLVE NULTI-PASS 00 152,42 152,39 00 0,016 -0,017 699 0,00	151-PASS 151-94 0000-0000-00000-00000-0000-0000-0000	151.58 -0.014 0.05 0.950 -0.424	18VOLVE NULTI-PASS 50 151.30 151.28 504 -3.013 -0.013 695 0.0 945 0.349 0.349 727 -0.396 -0.393	INVOLVE GHLTL-PASS 00 101.30 151.20 00 0.01 -0.013 -0.013 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00
INVELVE NOL. CC 153.69 22 -0.023 345 0.956 034 -C.676	LAVOLVE RULTI-FASS CC 152.99 152.95 U00 -0.020 -0.020 U10 0.054 -0.954 O10 0.054 -0.9548	152.42 -0.016 0.0 0.953 -0.521	INVOLVE MULTI-PASS 00 151.94 151.94 002 -0.016 -0.016 059 0.0 0.0 951 0.951 0.951 791 -0.466 -0.462	1MVOLVE NULTI-PASS 0. 151.00 151.50 00. 0.014 -0.014 00.950 0.950 0.950 0.950 757 -0.427 -0.428	0LVE NUL 151.30 0.013 0.949 -0.396	121.30 -0.01.40 -0.00 -0.449 -0.196
156. CC 0. 322 -4. dc 5 0. 956 143. 0 Ju	150.60 0.000 -4.000 14.054	150.00 -0.001 -4.699 0.599	150.00 -0.002 -4.699 6.951	15C - 0 - 1 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0	15C. 0C -0. 004 -4. 699 0. 949 139. 727	150.00 -0.004 -4.000 1.449 1.59.7
TINE 750.00 TEMPERALIED NECH SLALES PLASIIC STAIN TOFAL STAIN STRESS	TEMPERATURE NECLA STATIN TOTAL STRAIN STRESS	TIME #50.00 TEAFMATURE HECH. STRAIN PLASILE STRAIN TOULE STRAIN STRESS	TIMER 900.00 TEMPERATURE RECH. STRAIN PLASILC STRAIN TOTAL STRAIN	TEMPERATURE MECH. SEMAIN PLASTIC STANIN TOTAL SIMAIN	TINE 1005.00 TEXPERATURE RECH. STHAIN PLASTIC SFRAIN TOPAL SFRAIN STRESS	TIME= 1000.00 TEMPERATURE MECH. DISALM PLASSIC STRAIN STRAIN



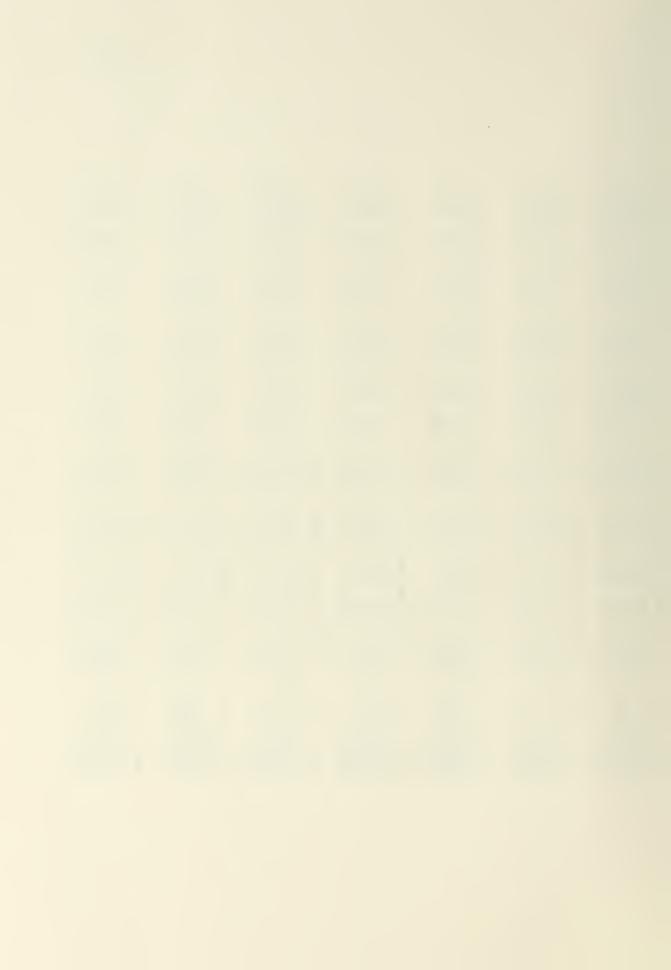
	150.29 -0.016 0.0 0.940 -0.440		153.29 -0.016 0.0 3.943 -0.476		150.29 -0.016 0.940 -0.470		150.29 -0.016 0.940 -0.476		150.29 - 0.010 0.940 - 0.476		150.29 -0.016 0.940 -0.476		156.29 -0.616 0.0 0.943 -0.476
	150.41 -0.017 0.0 0.04C -0.560		150.41 -0.017 9.0 0.940 -0.530		153.41 -0.017 0.01 0.740 -0.500		150.41 -0.0:7 0.0 0.440 -0.500		150.41		150.41 -0.017 0.0 0.34C -0.500		150.41' C.0 0.940 -C.50C
2	150.56 -C.21d 0.0 0.940 -C.531		150.56 -0.31d 0.0 0.940 -0.531		150.26		150.56		156.56 0.01d 0.040 -0.531		150.56 -0.01d 0.0		150.50
	150.97		150.97 -0.021 0.0 0.943 -0.613		150.97 -1.021 0.0 0.447 -0.613		150.47 -0.021 0.0440		150.97 -0.021 0.940 -0.940		150.97 -6.621 0.0 0.943 -0.613		150.97
	151.20 -0.322 0.0 0.940 -0.940		151.20 -0.322 0.0 0.0 0.940 -0.661		151.23 -0.022 3.3 0.140 -0.661		151.20		151.20 -0.022 0.0 0.943 -0.661		151.20 -0.022 0.0 0.940 -0.661		151.23 -0.022 C.0 0.943 -0.061
	151.22 -0.022 0.940 -0.665		151.22 -0.322 0.0 0.94C -0.665		151.22 -0.322 0.0 0.940 -0.665		151.22 -0.022 -0.022 -0.440 -0.665		151.22 -0.022 0.0 0.940 -0.665		151.22 -C.022 0.0 C.940 -0.665		151.22 -0.322 C.C 0.943 -0.665
2 PASS	151.26 -0.023 C.0 0.940 -0.673	2 PASS	151.20	2 PASS	151.26	2 PASS	151.26	2 PASS	151.26	2 PASS	151.26 -0.02 0.0 -0.940	2 PASS	151.26
EPFect	151.27 -0.023 0.0 0.940 -0.675	EP? ECT	-0.023 0.0 0.940 -0.675	EFFECT	151.27 -0.023 0.0 0.940 -0.675	9 PEC 23	151.2/ -0.023 0.0 0.940 -0.675	101343	151.27 -0.023 0.940 -0.675	EFFECT	151.27 -0.023 0.0 0.940 -0.675	RPLCT	151.27 -0.023 E.f. 0.943 -0.675
TI-PASE	151.28 -0.023 0.940 -0.978	TI-FASS	151.28 -0.023 0.0 0.946 -0.678	TI-FASS	151.28 -6.323 0.0 6.346 -0.670	TI-PASS	151. Zu -0.023 -0.940 -0.940	INVOLVE KULTI-PASS	151.24 -0.023 6.0 0.940 -0.578	TI-PASS	151.28 -0.023 0.0 0.0	11-PASS	151.29 -0.323 C.0 0.540 -0.678
TAE WAT	151.30 -0.023 0.0 0.940 -0.681	INVOLVE RULTI-FASS	151.30 -0.023 0.0 0.940 -0.940	INVOLVE RULTI-FASS	151.30 -0.023 0.0 6.440	ANVOLVE BULTI-PASS	151. JG -0.023 0.00 0.00 -0.940	LVE RUL	151.30 -0.023 0.0 0.943 -0.641	ANVOLVE NULTI-PASS	151.30 -0.02 0.0 0.94 -0.68	INVOLUE RUETA-PASS	151.1C -0.0Z3 C.0 0.940 -0.681
TH VO	153.00-0.014-0.014-0	INVO	15C. CO. CO. CO. CO. CO. CO. CO. CO. CO. C	77 47	150.00	CANT	150.00 -0.014 -4.649 0.940 139.442	CANT	150.00 -0.014 -4.049 0.940	OANT	150.30 -0.014 -4.059 0.046 139.482	INAC	150.05 -0.014 -4.059 0.940 139.431
0.0	FORESTE STATE	1.00	75 14 22 < 2	2.00	CONTRACTOR	3.00	ATURE SIRALA C SIRALA SIRALA	60.4	ATURE STRAIN C STRAIN STRAIN	5.00	TERPENATURE MECH: SIMAIN PLASIIC SIMAIN TOTAL SIRAIN STRESS	06.9	TEMEGRATUSE HECH: SIGAIN PLACIT SERAIN STRESS
TIME	TERRERA PLASING STRESS	10 17 14 (4	TEMPERATURE RECH. STRAL PLASIIC SIR TOTAL SERAL SIRESS	TIBLE	TERPER PLASEL TUTAL STRESS	TIME	TENIER RECH. PLAST1 TOFAL STRESS	# 7 F F	TERPES RECH: PLASTI TOTAL STRESS	THE	TERPERATURE RECH. SERB PLAN SER STATES STATES STATES	E 33	MECH. PLAKIT TOTAL



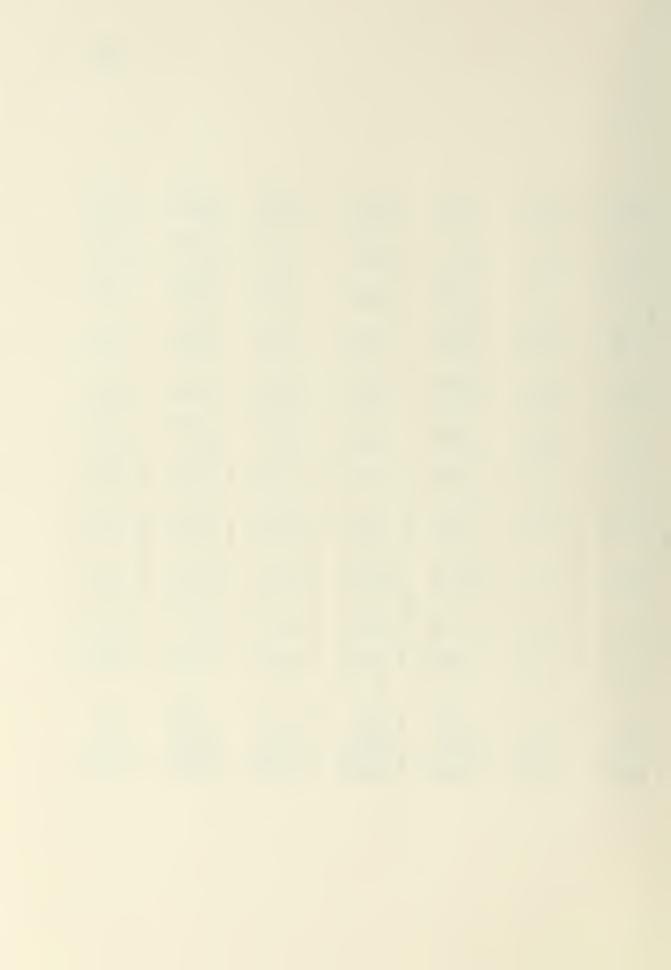
156.29 -3.016 6.0 0.540 -0.475	150.29 -0.0.15 0.0941 -0.448	150.29 -0.001 0.0 0.0 0.0 0.0	150.29 0.003 1.03d 2.458	150.29 0.093 0.0 1.049 2.765	150.29 0.108 0.0 1.064 3.223	350.29 0.124 0.0 1.080
150.41 - 0.017 0.940 - 0.499	150.41 -0.016 0.0 -0.411	150.41 -C.C01 0.0 C.955 -C.643	150.41 0.082 0.0 1.038 2.434	150.41 0.092 1.049 2.741	150.41 0.107 0.0 1.064 3.199	150.41 0.123 0.6 1.680 3.688
150.56 0.010 0.540 -0.540	150.56 -0.017 0.0 0.941 -0.563	150.56 -0.002 0.0 0.955	156.59 0.081 6.0 1.034 2.403	150.56 0.091 1.049 2.710	150.56 0.106 1.064 3.168	150.56 0.122 1.080 3.637
150.97 -0.021 0.0 0.940	150.97 -0.020 0.0 0.941 -0.585	150.97 -C.335 0.0 0.955 -C.156	156.97 0.078 6.0 1.038 2.321	150.97 6.008 0.0 1.049	150.97 6.104 0.0 1.064 3.085	150.97 0.119 1.080 1.584
151.20 -0.022 0.0 0.940	151.20 -0.021 0.0 0.941	151.20 -0.007 0.0 0.455 -6.203	151.20 0.076 0.0 1.038 2.273	151.20 0.087 0.0 1.049 2.500	151.20 0.102 0.0 1.064 3.034	151.20 0.118 0.0 1.080 3.507
151.22 -0.022 0.0 0.94C	151.22 -0.021 0.0 C.941 -0.637	151.22 -C.CG7 C.0 0.955 -0.208	151.22 0.076 0.0 1.034 2.269	151.22 0.047 0.0 1.049 2.575	151.23 0.102 0.0 1.064 3.033	151.23 0.11d 0.0 1.040 3.500
2 FASS 151.26 -0.023 0.94C	2 FASS -0.022 0.0 0.941 -0.645	2 PASS 151.26 -0.007 0.0 0.355	2 PASS 151.27 0.0 0.0 1.634 2.259	2 PASS 151.31 0.086 0.0 1.049 2.559	2 PASS 151.40 0.101 0.0 1.064 2.997	2 PASS 151.62 0.0115 1.080 1.421
151.27 -0.023 0.946 -0.675	151.28 -0.622 0.0	151.29 -0.007 0.0 0.0 0.5	151.35 0.075 0.0 1.038 2.242	151.57 0.08 # 1.049 2.505	152.58 0.093 0.0 1.064 2.758	154.20 0.097 0.0 1.600 2.897
AULII-PASS 32 151.29 043 -6.023 0 040 C.940 665 -1.677	151-30 -6-622 -0-0 -0-654	151.40 -0.308 0.955 -0.264	152.14 0.070 0.0 1.030 2.083		158.28 0.054 0.054 1.064	165.29 0.021 0.021 1.046
151. 151. 0.0.	ANVOLVE NULTI-FASS 50 151.56 151.30 216 -C.024 -C.622 649 0.3 0.0 941 0.941 0.941 008 -0.70c -0.654	INVOLVE RULTI-FASS 445 -0.029 -0.008 695 0.755 0.955 955 0.755	1MVOLUE RULTI-PASS 00 1ec.49 15.14 5d7 -0.028 0.070 5d7 0.0 0.0 016 1.038 1.036	IMVOLVE SULTI-PASS 03 190.29 154.07 576 -0.225 0.067 576 0.0 0.0 049 1.049 1.049	LNVOLVE NULTI-PASS 00 238.78 158.28 561 -0.512 0.054 561 0.0 0.0 064 1.064 1.599	INVOLVE NULTI-PASS 00 279.54 165.29 545 -0.793 0.021 545 0.0 0.0 080 1.080 1.080
151.66 -0.025 -4.699 6.940 139.083	729.50 -0.216 -4.649 0.441	A 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	2506.00 -17.547 -17.547 1.048	2500.03 -17.576 -17.576 -17.576 0.0	2500.00 -17.561 -17.561 1.064	ZSC. 00 -17.545 -17.545 -17.545
7.30 TRAIL TRAIN TRAIN	2	COOO	-	0 3	=	0 =
TIME 7.30 TEMPLEATURE MECH. STRAIM PLASTIC STRAIM TOTAL STRAIM STRESS	TIME 0.00 TENPERATURE MECH. STRAIN PLASTIC STRAIN STRESS	TIME: 0.03 TEMPERATURE MECH: STRAIN TOTAL STRAIN STRESS	TIME 10.30 TEREBRICHE RECH. STRAIM PLASTIC STRAIN STRESS	TIME. 11.0. TEMPERATURE RECH. SIRAIM PLASTIC STRAIM STRESS	TIRE 12.00 TERPERATURE RECH. STRAIM PLASTIC STRAIM TOTAL STRAIM	TIRE 13.0 TEMPERATURE MECH. SIGALM PLASTIC STRA TOTAL STRAIN STRESS



150.29 0.134 1.094 4.166	150.29 0.149 0.0 1.105 4.446	150.29 0.153 0.0 1.114 4.726	150.29 0.167 0.0 1.122 4.957	150.29 0.173 0.0 1.129 5.151	150.29 0.17) 9.0 1.134 5.318	550, 229 0, 623 0, 0 1, 063 2, 883
150.41 0.137 0.137 1.036 4.042	150.41 0.149 0.0 1.105 4.422	159.41 0.158 0.0 1.114	00 00 00 00 00 00 00 00 00 00 00 00 00	150.41 0.172 0.0 1.129 5.126	150.41 0.178 0.0 1.114 5.294	153.41 0.0 0.0 1.053 2.859
153.50 0.130 1.094 4.052	150.56 0.148 0.0 1.135	159.56 0.157 0.0 1.114	153.56 0.0165 1.165 4.902	150.56 C.1711 1.129 5.096	159.56 0.177 0.0 1.134 5.263	159.56 5.095 0.0 1.053
150.97	150.97 0.145 0.0 1.135	150.97	150.97 0.162 0.0 1.122 4.819	150.97 0.160 0.0 1.129 5.013	150.97 0.174 0.0 1.134 5.183	150.97
151.23 0.132 0.0132 1.794 3.920	151.21 0.143 6.0 1.135 4.259	151.23 0.152 0.0 1.114	151.45 0.169 0.0 1.122	151.30 0.166 0.0 1.129 4.946	0.171 0.0 171 1.114 5.100	151.46 6.689 0.0 1.053 2.645
151.25 0.0 1.094 3.911	151.29 0.143 0.0 1.105 4.244	151.35 0.152 0.0 1.114 4.510	151.46 0.159 1.122 4.719	151.63 0.164 0.0 1.129 4.878	152.22 0.166 0.0 1.134 4.925	152.70
2 RASS 152.48 0.123 0.123 1.094 3.061	2 PASS 153.53 0.127 (.0 1.105 3.749	2 PASS 155.03 0.126 1.114 3.761	157.03 0.121 1.122 3.586	2 PASS 0.110 0.110 1.129 3.279	2 PASS 162.33 0.096 0.0 1.134 2.865	2 PASS 165,449 00.0 1.053 1.053
156.86 0.093 1.094	160.60 0.079 0.079 0.0 1.105	165.32 0.056 0.056 1.114	170.79 0.026 0.0 1.122	176.74 -0.009 6.0 1.129	182.89 -0.046 0.0 1.134 -1.359	189 06 -0.171 0.0 1.053
#ULTI-PASS 97 174.79 020 -0.00 094 1.094 763 -0.298	185.89 -0.096 -0.096 1.105	EULTI-1755 .55 197.59 .297 -0.105 .0 0.0 .114 1.114	2 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	219.43 -0.312 (.0 1.129 -9.264	229.60 -0.376 0.0 1.134 -11.092	HULTI-PASS 21 238-14 546 -6.519 00 0.0 0053 -16.5300
11. 311. -1. -2.	INVOLVE BULII-PASS 00 3JS.36 185.89 520 -1.184 -0.096 520 0.0 0.0 105 1.105 1.105 0 -34.417 -2.847	10 351.55 511 -1.297 511 -1.297 511 -1.14 0 -37.619	INVOLVE HULTI-PASS 00 302.42 269.07 563 -1.371 -0.442 504 0.0 122 1.122 1.122 0 -39.720 -7.152	INVOLVE MULTI-1ASS 00 369.49 219.43 496 -1.418 -0.312 496 0.0 C.0 129 1.129 1.129	IMVOLVE RULII-PASS 00) 373-83 229-60 411 -1446 -0.376 491 0.0 0.0 134 1.134 1.134	3.76. - 1.00.
2530. 30 -1 531 -17.531 -17.531	2500.00 -17.520 -17.520 1.105	2550.00 151.55 -17.511 -1.297 -17.511 0.0 1.114 1.114	1NVOLVE 60L -17.503 -1.371 -17.503 -1.371 -17.503 0.0 1.122 1.122 0.0 -39.720	2500.00 369.49 -17.490 -1.418 -17.490 0.0 1.129 1.129 0.0 -41.042	2500.00 373.83 229.60 1-17.41 -1.446 -0.376 -17.491 0.0 0.0 1.34 1.34 1.34 1.34 1.34 1.34 1.34 1.34	2397.22 -16.682 -17.683 0.332
26	. c × ×	0 NAW	0 44 %	z	14.00 14.00 18.44	
TERPERATURE HECH. SIRAIN PLASTIC SIRAIN PLASTIC SIRAIN TOTAL SIRAIN SIRISS	TIME: 15.0 TEMPERATURE HECH: STPAIN PLASTIC STRA TOTAL SERAIN STRESS	TIMES 10. TEYPERATURE HECH. SERAL PLASIIC STR TOTAL SERAL STRUSS	TINE TINE TO SERVINE NECH SINAT SINA	TINE 10.00 TEN ERALURE HEUL STRAIN PLASIC STRAIN STRESS	TIME 19.30 TEAPERATHEM RECH. STRAIN TOTAL STRAIN STRING	TIME 20.00 TERPERATORE MECH. SIMALM PLASILC STRAIN TOTAL STRAIN STRESS



	,					
150.25 0.11h 0.0 1.074 3.525	150.25 0.113 0.0 1.075 3.550	150.29 0.119 1.075 3.549	150.29 0.11H 0.0 1.374 3.51B	150.29 0.116 0.0 1.072 3.464	150.29 0.114 0.0 1.069 3.180	15 0, 29 C. 110 C. 0 1, 0, 6 3, 245
150.41 C.0 1.074 3.500	150.41 0.118 0.0 1.075 3.525	150.41 0.0 1.070 3.525	150.41	150.41 0.116 0.0 1.072 3.440	150.41 0.113 0.0 1.069 3.156	150.41 0.0 1.00c 3.201
150.56 0.117 0.0 1.074 3.470	156.56 0.117 0.3 1.075 3.495	150.56 C.117 0.0 1.075 3.495	150.56 0.116 0.016 1.024	150.56 0.115 0.0 1.072 3.409	150.56 0.112 1.069 3.325	150.06 0.109 1.06 3.250
150.97 C.114 C.0 1.074	156.98 0.115 0.0 1.075 3.409	151.07 0.114 0.0 1.075 3.391	151.32 C.111 C.0 1.074 3.309	152.11 0.104 0.0 1.072 3.094	152.97 0.095 1.069 2.437	153.97 0.045 6.0 1.066
156.69 0.075 0.0 1.074 2.223	166.29 0.010 0.0 1.075 0.289	175.75 -0.056 0.0 1.075 -1.650	183.09 -0.10d 0.0 1.074 1.074	186.21 -0.145 0.0 1.072 -4.304	191.51 -4.171 0.0 1.069 -5.069	193.44 -0.168 0.6 1.066 -7.563
163.46 0.324 6.0 1.074	177.42 -0.370 0.0 1.075 -2.376	169.07 -0.140. 0.0 1.075 -4.396	196.43 -0.201 0.0 1.074 -5.953	260.77 -0.233 0.0 1.072 -6.907	203.01 -0.252 0.00 1.069	203.82 -0.201 (.0 1.054 -7.720
2 PASS 199.06 -0.213 0.01 1.378	2 PASS 219.42 -0.163 0.01 1.075	2 PASS 228.39 -0.427 0.0 1.075	2 PASS -0.449 0.0 1.074	231.14 -0.449 0.0 1.072 -13.253	2 PASS 229.29 -0.439 0.0 1.669 -12.948	2 PASS 226.61 -0.423 0.0 1.000 1-000 -12.440
233.56 -0.465 0.0 1.074 -13.702	၁ ကစ	253.12 253.12 0.0 1.075	251.38 -0.594 (.074	247.53 -0.568 0.0 1.072	242.87 -0.537 -0.537 -1.009	- 6 5
RULTI-FASS 6 279-53 112 -0.799 74 1.074 108-23-424	284.08 -0.812 1.075 1.075	AULTI-PASS 52 276.94 065 -0.794 0 0.0 075 1.075	271.33 271.33 6.0.739 1.074	263.33 -0.682 0.0 1.072 -20.046	255.66 -0.629 0.0 1.009 -16.504	244.52 244.52 -0.581 1.066 -17.096
261.46 -1.412 C.0 1.074 -40.908	336.63 -1.223 0.0 1.075	315. 315. 11.	293.24 -0.938 0.0 1.074	INVOLVE NULTI-6ASS 75 284.02 263.33 224 -0.834 -0.682 745 0.0 0.0 072 1.072 1.072 719 -24.449 -20.046	INVOLVE NULTI-FASS EFFECT 12 272.04 255.66 242.87 549 -0.749 -0.629 -0.53 160 0.0 0.0 0.0 009 1.009 1.009 1.00 977 -21.974 -16.504 -15.80	261.79 -0.677 0.0 1.066
1491.70 -10.501 -13.219 1.074 16.031	10 34.51 -7.257 -11.394 1.075	ZN VO 749.74 - 4.595 - 845 - 1.075	573. -3. -7. 123.	1880 465.75 -2.224 -6.745 1.072	364.12 -1.569 -6.160 1.069	18 VO 324.34 -1.140 -1.066 13.612
TEMPERATURE TEMPERATURE TECH STRAIN TOTAL STRAIN TOTAL STRAIN	TEMPERATURE SECTION PLASTIC STRAIN TOTAL SERAIN STRESS	TEMPERATURE RECH. STRAIN PLASIC STRAIN TOTAL STRAIG	TIRE= 60.00 TERPERATURE MECH. STRAIN PLASTIC STRAIN TOIAL STRAIN STRESS	TIMES 70.00 TEMPERATURE MECH. STRAIN PLASIIC STRAIN TOTAL STRAIN STRESS	TIME HO.33 TEMPERATURE MECH. SIRAIN PLASILE SIRAIN TOTAL STRAIN STRESS	TEMPSPARURS MECH. SIRALM PLASHIC STRALM TOTAL SIRALM



150.29 0.137 0.3 1.30.3	150.29 0.049 0.0 1.045 2.048	150,29 C.072 0.0 1.027 2.133	153.29	156.39 0.045 0.0 1.001 1.344	150.32 0.035 0.00991	350-35 6-02 6-0 9-9-8-2 6-7
150.41 0.100 0.0 1.003 3.154	150.41 0.048 0.0 1.045 2.624	153.42 0.071 1.327 2.107	150.46	150.53 0.04 0.0 1.031	150.62 0.033 0.0 0.91	150.72 0.024 0.0 0.09 0.082 0.702
150.56 3.105 5.0 1.063	159.68 0.086 0.0 1.045 2.570	151.31	151.66 9.648 1.01 1.432	152.11	152.40	152.55 0.011 0.982 0.332
155.05 0.074 0.0 1.003 2.215	159.75 0.024 0.024 1.045	161.9H -0.06d 0.0 1.027	162.32	161.66 -0.032 0.0 1.001 -0.965	160.57 -0.035 0.0 0.191 -1.046	159, 15 -0.035 0.05 -1.651
194.37 -0.198 0.0 1.063	191.63 -0.197 0.0 1.045	185.23 -C.109 0.0 1.627 -5.013	179.00 -0.140 0.0 1.013	173.66 -0.115 0.00 1.001 -3.418	169.29 -0.095 0.0 0.991 -2.826	165.77 -0.019 0.06 -2.300
203.70 -0.263 C.U. 1.303 -7.790	197.04	188.57 -0.1% 1.027 -5.703	181.10 -0.135 0.0 1.013 -4.597	175-10 -0-125 0-0 1-001 -3-714	170.28 -C.102 U.0 0.991 -5.329	166.47 -0.034 C.b 0.982 -2.503
2 PASS 223.53 -0.405 6.6 1.063 -11.940	207-68 -0.10 -0.10 -7.10 -4.10	2 PASS -0.236 0.3 1.627 -6.951	2 PASS 185.06 -0.182 6.0 1.013 -5.404	2 PASS -0.143 0.0 1.061 -4.243	2 PASS 172.03 -0.114 0.0 0.991 -3.388	2 PASS 167-70 -0.053 0.982 -2.753
233.17 -0.473 0.5 1.063 -13.959	212.45 -0.343 -0.00 1.005	197.53 -0.255 0.0 1.027 -7.552	146.76 -0.194 1.013	178.74 -0.150 1.00.1	172.77 -0.119 0.00 0.091 -3.538	108.21 -0.096 0.962 -2.858
Z41.98 -0.537 0.0 1.063	216.65 -0.373 -0.373 -1.045	11 - PASS - 1994 U3 - 0.0271 - 0.077 - 0.077 - 0.077 - 0.077 - 0.036	24 VOLVE RULTI-PASS 72 149.64 180.18 041 -0.216 -0.204 816 0.6 0.0 0503 -6.386 -6.043	174-FASS 174-66 000 1.001 1.001	173.38 -0.123 0.00 0.991	11-PASS 160.64 -0.099 0.982 -2.945
ENVOLVE RUI 64 252-93 820 -0.616 935 C.0 0.0 0.1 -14-122	LVE MH: 221.67 -0.409 0.0 1.045	INVOLVE RULTI-FASS 41 202.58 199.43 009 -C.291 -0.271 816 0.0 0.0 0.7 1.027 1.027 465 -8.606 -8.03	169.84 -0.216 -0.0 1.013 -6.386	180.71 -0.164 0.01 1.001 -4.868	174.08 -9.128 3.0 0.991 -3.807	INVOLVE AULTI-PASS 22 109.12 160.64 327 -0.102 -0.099 416 0.0 0.00 952 0.902 0.995 131 -3.044 -2.945
280.44 252.43 -0.816 -5.43 -0.616 -5.435 -0.0 1.003 1.003 11.003 11.0.23 11.0.	163.82 -0.142 -4.616 1.045 1.36.591	159.41 0.003 -4.816 1.0.7 143.465	152.72 0.041 -4.816 1.013 144.503	150.81 0.042 -4.616 1.001	150.24 C.035 -4.81 C.991 144.375	155.20 0.327 -4.816 0.982
ETABLE DO SO	TIME 190.00 TERET PATGE RECH. SIPAIN PLASIIC STRAIN STRAIN STRAIN	TIME - 200.00 TEMIEMAINA PLANIS STAIN PLANIC SFRAIN STRAIN STRAIN STRAIN STRAIN STRAIN STRESS	TIME 250.00 TEST 250.00 PLASTE STALM PLASTE STRAIM STREES	TIMES JOU.63 TEMFERIAE PLASTIC SERAIN FOLL SERAIN STRESS	TIME 150.00 TEXTERATURE FECH. STRAIN PLASTIC SIRAIN TOTAL STRAIN	TIME 400.00 TEMPRATURE MECH. STALN PLASHIC STALN STALN STALN STALN
H HATEN	H FEELS	HEARN	H HEALD	E EEZZZ	H FEGES	F FEGTS



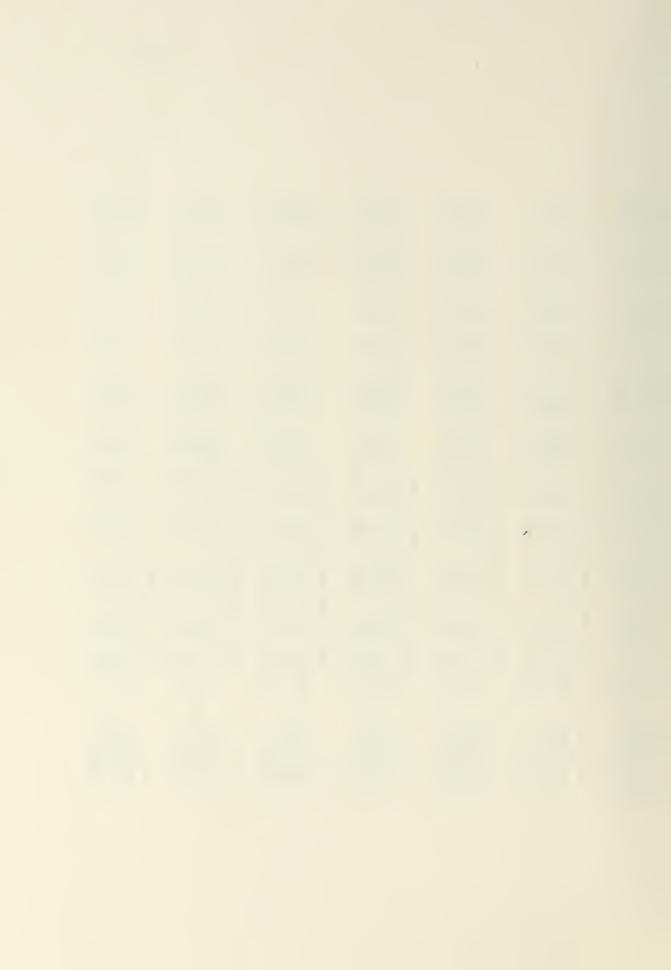
150.39 0.019 0.975 0.557	150.44 0.012 0.0 0.969 0.372	153.48 0.00 0.01 0.0164	5.00.03 5.00.03 5.00.03 5.00.03	150.56 0.03 0.03 0.057	150.58 -0.004 0.954 -0.115	153.66 -0.006 -0.00 -0.007 -0.126
150.01 0.016 0.975 0.472	153. cd. 9 0.00. 9 0.00. 00. 00. 00. 20. 00. 20. 10. 20. 10. 10. 10. 10. 10. 10. 10. 10. 10. 1	150.95 0.034 0.00 0.004	150.95 -0.00 0.0 0.0 -0.00 -0.00	150.96 0.00 0.00 0.057 -0.105	150.94 -0.00e 0.954 -0.187	150.01 -0.008 0.00 0.00 -0.008
152.57 0.004 0.075	152.50 -0.002 0.0 0.167	152.38 -0.00e 0.0 0.0 0.0 0.0	152.22 -0.009 0.009 -0.256	152.35 -0.011 0.0 C.957 -0.327	151.09 -0.013 0.954 -0.379	2000 - 1 2000 - 1 2000 - 1 2000 - 1
158.16 - 0.034 0.975 - 1.020	157.07 -0.033 0.0 0.969 -0.974	156.11 0.0 0.0 0.96%	155.27 -0.030 0.0 0.960 -C.478	154.56 -0.028 0.0 0.0 -0.457	153.96 -0.027 C.C 0.954 -0.798	153.45 -0.025 -0.03 -0.952
162.95 -0.047 0.0 0.975 -1.994	160.68 -0.057 0.0 0.969 -1.708	154.06 -0.050 0.0 0.0 0.0 0.0 -1.484	157.40 -0.044 0.0 0.960 -1.310	156.23 -0.039 0.0 0.457 -1.175	155.28 -0.036 0.05 0.954 -1.068	154.52 -0.033 0.0 0.952 -0.971
163.45 -0.371 0.0 C.975 -2.397	161.05 -0.060 0.0 0.969	159.14 -0.052 0.0 0.964 -1.541	157.61 -0.046 0.0 0.960	156.39 -0.061 0.0957 -1.208	155.41 -0.037 -0.037 -0.454	154.62 -0.033 0.0 C.952 -0.991
2 PASS 164.33 -0.077 3.0 0.975	161.70 -0.00 0.00 0.00 -1.915	2 PASS -0.055 0.0 0.0 0.0 1.904	2 PASS 157.56 -0.046 0.960 -1.427	2 PASS 150.07 -0.043 0.0 0.957 -1.265	2 PASS 155.63 -0.034 0.954	2 PASS 154.80 0.0 0.0 6.952
164.69 -0.079 0.0 C.975	2 0 2	PECT 9.82 9.056 0.06 1.678	2 26	156 TECT - 15 CT - 15	155.72 9 -0.039 0 0.0954 2 -1.157	154.87 -0.035 -0.03 -1.04
MULII-PASS 34 164.99 008 -0.061 0 0.0 975 -0.975	1M VC.VE hULTI-PASS EFFECT 03 162.43 162.1U 161.96 015 -0.069 -0.06U -0.06 016 0.0 0.0 017 0.969 0.969 0.969 018 -2.064 -2.014 -1.96	INVOLVE BULTI-PASS ER 01 10C.16 159.90 15 011 -0.059 -0.050 - 016 C.0 L.6 964 0.964 0.964	ANVOLVE NULTI-PASS EFFECT 30 158.39 158.25 158.13 606 -0.051 -0.050 -0.00 816 2.0 0.0 900 0.960 0.960 518 -1.511 -1.482 -1.45	11 11 11 11 11 11 11 11 11 11 11 11 11	11-PAS 155.75 -0.03 0.95	154.93 -0.035 0.0 0.05 1.053
165	162.43 162.43 0.069 0.0969	16C 16 -0.059 C.0 0.964 -1.749	158.39 -0.051 0.0 0.960 -1.511	156.99 156.99 0.0 0.0 -1.328	155. Up 155. Up 0.040 0.040 0.954 0.954 0.045	LAVOLVE BULFI-PASS 62 154.49 154.93 104 -3.036 -0.335 700 3.0 0.0 972 (.952 (.952
15C.07 165 0.021 -0 -4.816 0 2.975 6.	150.03 C.015 -4.816 C.yey	150.021 510.021 510.03 163.03 143.03	150.00 - 4.000 143.5816 143.5816	150.00 C. GCJ -4.016 0.957	150.00 0.003 -4.416 0.954 143.33C	156.65 -0.000 -0.000 -4.700 14.855
TIME 450.30 TERPLRATURE SICH-STRAIN PLANIC STRAIN STRESS.	TIME= 500.00 TEMPLATURE RECH. STRAIN PLASTIC STRAIN STRISS	TIME= 550.00 TENVERATORE MECH. SIVAIN PLASTIC STRAIN STREES	TIME= 600.00 TENICHAPURE MECH. STRAIN PLASTIC SERAIN TOLAE SERAIN STRESS	TIMES 050.00 TENPERATORE MECH. STRAIN PLASIZE STRAIN TOTAL STRAIN STRESS	TIME= 706.00 TEMBURATURE MECH. SIRAIN PLAJIC STRAIN TOTAL SIRAIN STRESS	TIME= 750.00 TENECRATURE NECH. SIPALN PLUSILG STARN TOTAL SIZAIN



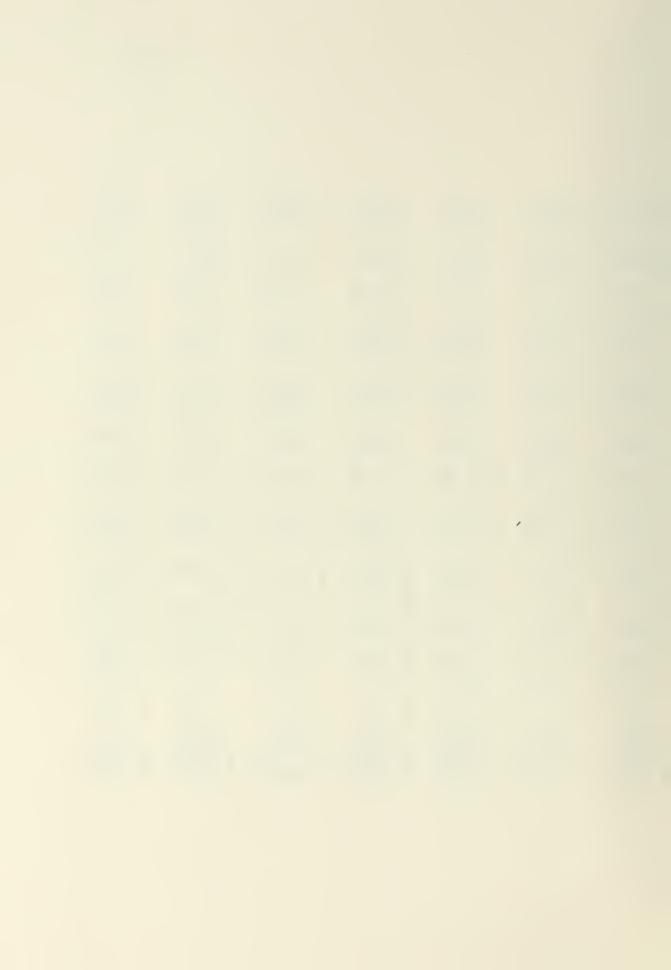
-	0.0		150.01 -0.010 0.0 0.0 0.949 -0.285		159.6C -0.011 9.C 0.947 -0.322		150.54 -C.012 0.0 C.946 -0.355		150.58 -7.013 C.C 0.945 -0.381		153.58 -3.018 9.0 0.945 -0.331		150.58 -0.024 0.0 0.934 -0.700
	0.956		150.84 -0.011 0.0948 -0.332		150.44 -0.01 0.0 -0.447		150.85 -C.014 0.0 C.346 -0.407		153.82 -0.014 0.50 -0.429		150.62		150. HZ -0.025 0.0 0.0 0.9
_	0.0		151.14		151.32 -0.016 0.0 0.947 -0.467		151.21 -0.010 0.0		151.12 -C.516 C.C 0.945 -C.493		151.12 -0.016 0.0 0.945 -0.490		151.12 -6.027 0.0 0.0 0.934 -0.609
153.32	0.0 0.950 -0.725		152.67 -0.024 0.943 -0.703		152.38		152.13 -0.022 0.0 0.446 -0.667		151.93 -0.022 0.0 0.945 -6.650		151.93 -0.022 6.0 0.945 -0.656		151.4) -6.03) 0.0 0.934 -0.975
-	0.0		153.40 -0.029 0.0 0.348 -0.851		153.00 -0.027 0.947 -0.307		152.67 -C.026 0.0 0.946		152.43 -0.025 C.0 0.945 -0.750		152.40 -0.025 6.0 C.945 -0.75^		152.40
153.99	0.0 6.950 -0.320		153.47 -0.629 0.948 -0.865		153.06 -0.028 0.06 0.947 -0.419		152.72		152.44 -0.026 0.0 0.945 -0.759		152.44 -0.026 0.0 0.945 -0.759		152.42
2 PASS 154.13 -C.032		2 PASS	153.59	2 PASS	153.15	2 PASS	152.80 -0.027 0.0 0.940 -0.803	2 PASS	152.52 -0.02 0.0 0.0 -7445	2 2355	152.52 -0.026 0.0 5.945 -0.774	3 PASS	152.52
154.19 -0.032	0.450	LPFECT	153.64 -0.030 6.6 0.948 -0.899	EFFECT	153.19 -0.028 0.0 C.947 -0.847	EPFECT	152.64	EFFECT	152.55	EPPECT	52.55 -0.026 0.0 0.545	RFFECT	152.55 -0.637 0.0 0.934 -1.099
8ULTI-PASS 25 154.23 033 -0.033	0.450	TI-PASS	153.67	TI-PAGE	153.23 -0.029 0.0 0.947 -0.854	INVOLVE RULTI-FASS	157.50	TI-PASS	152.57 -0.026 6.0 0.945 -0.185	ANVCLVE MULTI-PASS	152.57	TI-PASS	152.00 152.57 -0.037 -0.037 0.0 0.0 0.934 0.934 -1.110 -1.104
N 55	0.950	INVOLVE MULTI-PASS	153.72 -0.031 0.0 0.948 -0.915	INVOLVE RULTI-PASS	153.26 -0.029 0.0 44.7 -0.861	INE ENI	152.84 0.0 0.0 0.446 -0.446	INVOLVE MULTI-PASS	152.60	TAE WOI	152.60 -3.327 3.0 6.945 -0.793	ABVOLVE AULTI-PASS	152.00 -0.037 0.0 0.934 -1.110
150.00 -0.004	139.772	ANVO	150.00 -0.305 -4.70c 0.348 139.723	INVO	150.00 -0.007 -4.700 0.947	1.8 VO	150.00 -0.00 -4.70 0.44.0	IRVO	150.000 -0.009 -4.700 0.945 139.19	DART	136,00 152.66 152.57 1 -0,009 -0,027 -0,026 -4,700 0,0 0.0 0,945 6,945 0.545 139,019 -0,795 -0,785	OA ST	150.00 -C.020 -4.700 0.934
	PLASTIC STRAIN TOTAL STRAIN STREES	TIME= 450.00	TEMPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRENS	TERE # 100.30	TEMPERATURE RECH: STRAIN PLASTIC STRAIN STRESS	TIRE= 950.33	TEMPLRATURE HECH. STAALN PLASILU STRAIN TOTAL STPAIN STRFSS	TARE 1000.00	TERPETATORE MECH. SIBAIM PLASIIC STRAKM TOTAL SIRAIM STRESS	TIME= 1000.00	TEMPRATURE NECHO STAALN PLASTIC STRAIN TOTAL STAALN STRESS	TIME= 0.0	TLEFERATURE SECH. STRAIM PLASTIC STRAIM TOTAL SIRAIM STREES



	150.58 -0.924 0.5 0.934 -0.703	150.58 -0.024 C.?		150.58 -6.624 3.934 -0.700		153.58 -0.024 0.0 0.914 -0.700		150.58		153.58 -0.524 3.0 0.934 -0.700		159.58 -0.028 (0.934 -0.766
	150.82 -5.725 0.0 0.934 -5.749	150.02 -0.025 -0.025 -0.934		150.82 -0.025 0.0 0.934		150.42 -0.025 0.0 0.934 -0.749		150.82 -0.325 0.0 0.044 -3.744		150.82 -C.L25 0.0 0.934 -0.749		150.02 -0.625 0.014 -0.748
	151.12 -0.027 0.934 -0.409	151.12 -0.027 C.C	-0.809	151.12 -0.027 0.0 0.934 -0.839		151.12		151.12 -0.027 0.0 0.934 -0.909		151.12 -C.C27 0.0 0.934 -0.839		151.12 -2.027 C.C 0.934 -C.869
	151.93 -C.C.33 C.0 0.434 -C.975	151.93 -0.033 6.0		151.93 -0.633 0.0 0.934 -0.935		151.93 -0.033 0.0 0.934 -0.975		151.43 -0.033 0.0 0.934 -0.975		151.93 -0.033 0.0 7.934 -0.975		151.93 -0.033 3.0 0.434 -0.974
	152.40 -0.036 0.6 0.934 -1.009	152.40		152.40 -6.616 0.0 0.934 -1.069		152.40 -0.036 6.0 0.934 -1.669		152.40 -3.036 0.0 0.934 -1.069		152.43 -0.036 0.0 C.934 -1.069		152.40 -0.036 0.0 0.934 -1.069
	152.44 -0.036 6.0 0.934 -1.078	152.44 -0.036 0.0		152.44 -0.036 0.934 -1.078		152.44 -0.036 0.036 0.934 -1.078		152.44 -0.036 0.0 0.944 -1.078		152.44 -0.036 0.0 0.34 -1.074		152.14 -0.0.16 0.0 0.934 -1.078
3 PASS	152.52 -0.137 6.0 0.434 -1.093	3 PASS 152.52 -0.037 0.0	-1.393 3 PASS	152.52 -0.017 0.034 0.934 -1.093	3 PASS	152.52 -0.037 6.0 0.434 -1.093	J PASS	152.52 -0.037 0.0 0.934 -1.093	3 PASS	152.52 -0.037 0.0 0.734 -1.093	3 PASS	152.52
EFFECT	152.55 -0.037 0.0 0.934 -1.099	152.55 -0.037 0.034	-1.399 EFFECT	152.55 -0.037 0.0 0.934 -1.099	EPPECT	152.55 -0.037 6.6 0.934 -1.099	EPFECA	152.55 -0.037 0.0 6.944 -1.099	EFFECT	152.55 -0.637 0.0 0.934 -1.659	FFECT	152.55 -0.037 0.65 0.934 -1.099
RULTI-PASS	152.57 -0.037 0.0 0.934 -1.104	152.57 -0.037 0.0	-1.134 -1.17	152.57 -6.037 0.934 -1.104	INVOLVE RULTI-FASS	152.57	ANVOLUE RULTI-PASS	152.57 -0.037 0.0 6.934 -1.104	TI-PASS	152.57 -0.037 0.0 C.934 -1.104	II-PASS	152.57
21 20 10	152.60 -3.037 C.C. 0.734 -1.113	INVOLVE HULTI-FASS OC 152.60 152.57 020 -0.037 -0.037 310 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	303 -1.113 -1.134 INVOLVE MULTI-PASS	152.60 -C.C37 0.3 C.934 -1.110	LV 2 RUI	152.60	LVC SU	152.63 -3.337 0.3 C.934 -1.110	INVOLVE MULTI-PASS	152.60 -0.037 0.0 6.934 -1.113	INVOLVE KULTI-PASS	152.62
ANV	150.00	150.0C -3.020 -4.700	139.303 INVC	153.30 -C.423 -4.730 C.434 131.100	DANI	15C.00 -0.020 -4.700 0.934 139.5C0	DANT .	150.00	JA VI	150.03 -0.320 -4.700 934 139.293	INVC	151.69 -3.027 -4.700 0.934 139.004
1.33	20	2.30 . FORE SEMALM SEMALM	3.33	FORE LIAIS STEAIS TAIS	4.03	THE REPORT	5.03	ERPE STRAIN ERALU	6.33	FORE STERAN STERAN	7.00	TEMPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS
TIME	PERFORMATIONS PLACES STEADS PLACES STEADS FORMS STRESS	TIME 2.00 TEMPORATURE MECH. SFRAIN PLASTIC STRAIN TOFAL STRAIN	STREES TIME	TEMPERATORE RECHIS STRAIN TOTAL STRAIN	TIME	TERPEDATURE HLCH. STEAIN PLASIC STARIN TOTAL STRAIN STRESS	TIME	TEMPERATURE NECH. STRAIN PLASIIC SIRA TOTAL SIRAIN STRESS	TIRES	TEMPERATORE MECH: STAIR PLASTIC SIRA TOTAL STAKIN STRESS	TIME=	TEMPERATURE MECH. SERARA PLESTIC STAR TOTAL SERAIN STRESS



	5d 023 574		56 0 951		9 3 2 3		54		58 112 0 170 131		58 128 0.095 0.032		4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
	150.5d -0.023 9.0 0.935 -0.674		150.		153.58 0.00 0.0 1.044 2.547		150.58 0.097 0.0 1.054 2.874		150.58 6.112 3.0 1.670 3.331		150.		150.5d 0.142 0.0 1.099 4.216
	150.82 -0.024 6.0 0.935 -0.722		153.82 -3.Ccd 0.3 0.751 -0.245		153.62 0.005 0.0 1.344 2.519		150.82 0.095 0.0 1.054 2.826		150.82 C.11C 0.3 1.07C		150.82 C.126 C.6 1.095 3.753		150.62
	151.12 -3.026 (.3 0.435 -0.743		151, 12 -0.610 0.951 -0.335		151.12 0.2 83 0.5 1.044 2.454		151.12 0.393 0.3 1.054 2.765		151.12 C.1Cu 0.0 1.670 3.222		151.32 C.124 C.0 1.385 3.692		151.12
	151.93 -0.032 0.0 0.935 -0.949		151.93 -C.016 0.0 0.951		151.93 3.077 0.0 1.044 2.292		151.93 3.047 0.0 1.054 2.599		151.93 C.103 0.0 1.079 3.056		151.93 C.119 0.0 1.085 3.527		151.93 0.132 0.0 1.099 3.941
	152.40 -3.435 6.0 0.935 -1.043		152.43 -6.019 0.0 0.951 -0.565		152.40 0.074 0.0 1.044 2.196		152.40 0.00 0.0 1.654 2.505		152.43 6.100 0.0 1.070 2.961		152.40 0.115 0.0 1.085 3.431		152.40 0.129 0.0 1.099 3.645
	152.44 -0.035 0.0 0.935 -1.051		152.44 -6.019 0.0 0.951 -0.574		152.44 0.074 (.0 1.044 2.169		152.44 0.004 0.0 1.054 2.446		152.45 C.099 0.0 1.070 2.951		152.45 0.115 0.0 1.085 3.421		152.47 0.129 C.0 1.019 3.831
3 PASS	152.52 -0.036 0.0 0.735 -1.067	3 PASS	152.52 -0.020 3.3 6.951 -0.590	J PASS	152.53 0.073 0.0 1.044 2.171	J PASS	152.56 0.003 0.0 1.054 2.471	3 PASS	152.c6 6.058 0.0 1.070 2.908	3 PASS	152.88 0.112 0.0 1.085 3.334	3 PASS	153.74 0.120 0.0 1.399 3.573
EFFECT	152.55 -0.036 3.0 0.935 -1.073	EPP EC1	152.56	EPFECT	152.63 C.072 0.0 1.044 2.151	EPFECT	152.84 0.001 0.0 1.054 2.415	EFFECT	153.85 0.690 0.3 1.070 2.666	EPPECT	155.4U 1 0.094 6.0 1.085 2.806	RPFEC1	158.13 0.350 0.0 0.0 1.099 2.600
RULTI-PASS	152.59 -0.036 0.0 0.035 -1.001	EULTI-FASS	152.68 -c.621 0.0 0.951 -0.623	WOLVE AULTI-PASS	153.42	INVOLVE RULTI-PASS	155.36 0.064 0.0 1.054 1.403	LTI-PASS	154.57	RULTI-FASS	166.58 0.018 0.0 1.045 C.541	INVOLUE HULTI-PASS	170.08
TAT	152.86 -0.033 0.0 (.935 -1.136	INVOLVE EUI	155.76 -0.042 0.0 0.951 -1.247	LVE AUI	167.80 -0.032 0.0 1.044	INS BATC	197.59	IMVOLVE KULTI-PASS	239.89 -0.515 0.0 1.070 -15.166	INVCLVE RUI	240.76 -0.747 6.6 1.045 -23.354	OLVE AU	313.19 -1.323 0.0 1.099 -29.858
IMA	109.16 -3.150 -4.70d (.v3%	15 %	475.62 -2.423 -4.700 6.951 64.705	7 44	-17.581 -17.581 -17.581 0.0	I N A C	250c. 36 -17.571 -17.571 -17.571 -1.054	DA #1	2500.00 -17.555 -17.555 1.070 0.0	1 N K	2500.00 - 17.540 - 17.540 1.065 0.0	THAC	-17.52c -17.52c -17.52c
9.00	THE	,. 00	THEE FRAIN SIEAIN	16.00	ERADE STRAN POSTA SE	11.33	28	12.33	*	13.06		14.30	ж
IIRs=	TEMPERATURE MECH. STRALM PLASTIC STRALM TOTAL STRALM STREES	TIME=	TENERATURE MECH. SIRALA PLANIC SIRAL TOTAL SIRALA STALSS	TIMES	TETPERATURE HECH STRAIM PLASTIC STRAI TOIRE STRAIM STRESS	TIME	TEMPERATURE MECH. SERAIN PLACITC SIRAIN TOTAL STRAIN STRISS	11111	TEMPLHATURE MECH. STRAIN PLASSIC SIPA TOTAL STRAIN STRESS	TIME	TEMPERATURE RECH. SINAIN PLASIIC SINAIN TOIAL SINAIN STRESS	TINE=	TEMPERATURE HECH, SIMALM PLASSIC STRAL TOFAL SIMALM STRESS



	150.58 6.C70 3.0 1.C24 2.065	-	0.162 0.6 1.120 4.836			150.58 0.0 1.64 i		250.5d 0.091 0.0 1.04 2.707		150.54 0.094 0.0 1.051 2.790		150.58 0.094 1.055 2.904		150.58 c.103 0.0 1.085 3.183
	150.82 0.0 0.0 1.62 2.037	-	5.161 0.0 1.120 4.747		•	150.82 0.0684 0.0 1.043 2.488		150.82 0.089 0.0 1.049 2.659		150.82 0.092 0.0 1.051 2.742		150.82 0.00 1.055 2.855		150.02 0.10 0.0 1.06 0.14
	151.12 (.500 3.0 1.526 1.976	_	f.159 f.3 1.120 4.720		** F1 03	151.12		151.12 0.007 0.0 1.343 2.558		151.12 0.090 1.051 2.681		151.12 0.094 0.0 1.055 2.794		151-12 0-163 0-6 1-665 3-674
	151.43 C.001 0.0 1.628 1.628	-	0.3 1.123 4.560		350	151.93		151.93		151.93 0.0 0.0 1.051 2.515		151.93 C.084 U.0 1.055 2.62U		151.93 3.098 3.0 1.065 2.407
	152.41 0.0 1.028 1.713	_	0.15J 1.12J 4.469		2500.00000	152.45 0.072 0.0 1.043 2.156		152.53		152.54 0.080 0.0 1.051 2.387		152.66 6.633 6.0 1.355 2.480		157.89
	152.51 C.C57 0.0 1.028 1.034	-	0.00		2454,83	152.6H 0.0 1.043 2.109		152.45		153.44		153.92 C.075 0.0 1.055 2.225		164.69
	154.79 0.041 0.0 1.028 1.231	_	0.123 0.9 1.120 3.673	E PASS	2432.41 24	154.24	3 PASS	160.75	3 PASS	103.50 0.00 0.00 1.051 0.141	3 PASS	166.76 0.0 1.055 -0.393) PASS	205.11 -0.238 0.0 1.365
	161.88 -0.00.7 0.0 1.028 -0.213	12 2	0.0 0.0 1.120 1.568	CPFCI	2432	172.07 -0.062 0.0 1.043	LPPLCT	170.01 0.0 1.049 1.049	84 87 87 87 87 87 87 87 87 87 87 87 87 87	184.17 -0.138 0.0 1.051 -4.082	EVFECT	190.33	EPFECT	- 6.483 - 6.483 - 1.005
	187.18 -0.182 0.0 1.028 -5.406	NULTI-PASS	-0.172 c.5 1.120 -5.090	NULTI-PASS	TM.TO.TET	210.35	MULTI-PASS	221.10	LTI-PASS	236.06 -0.460 (.5 1.051 -13.805	HULT'I-PASS	239.40 -0.52c 0.0 1.055	AULTI-PASS	246.77 -0.818 0.0 1.965 -23.966
TAE	116.57	LVE AU 352.74	-1.343	TAVOLVE NUI	J= 1	363.62 -1.460 0.0 1.043 -42.274	ča.)	37C.64 -1.508 6.0 1.049 -43.616	ANVOLVE ENLTI	375.02 -1.548 0.0 1.051	1A)	377.41 -1.552 0.0 1.055 -44.860	(-1	362.06 260.77 4 -1.431 -0.810 0.0 0.6 1.365 1.965 -41.444 -23.906
I P V	2407.72 -16.799 -17.526 (.208	13 ec. og	- 17. 505 - 17. 505 1. 120 0.0	24 11	CONVERGE	2632.41 -17.450 -17.505 -17.505 0.005	THAOLA	2457.48 -17.239 -17.505 -17.505 C.050	PRAC	1594.09 -10.577 -12.91c 1.051 10.136	IDARI	15 J6.93 -10.582 -12.910 1.055 11.940	ATOART	1352.17 -7.436 -11.253 1.065 79.455
	JIC.		2.	17.00	30 30E		10.00		14.30	STRAIN STRAIN STRAIN	20.00	×	30.03	THAIN STRAIN
H (4)	TECTPERATURE BECH: STRAIN PLASSIC STRAIN TOTAL SIRAIN STRESS	**************************************	RECH. SIRAIN PLASFIC STRAE TOTAL SERAIN STRESS	FRUIT	TERP DO	TENDERATURUMECU. SIRAIN PLAUTIC SERAIN FOTAL SIRAIN STREET STREET	H 10 80 64 64	TEATERATUAL MECH. SIRAIN PLASTIC LERAIN TOTAL SIRAIN STRESS	TIMEs	TEMPERATURE RECH. SIRAI PLACIC SIR TOTAL SIRAI SIRESS	H 53 84 84 64	TERRER FURE HECH. STRAIN PLASIIC STRAIN TOTAL SIRAIN STRESS	TIME	TECCH STRAIN RECH. STRAIN PLASIC STRAIN TOTAL STRAIN STREIS



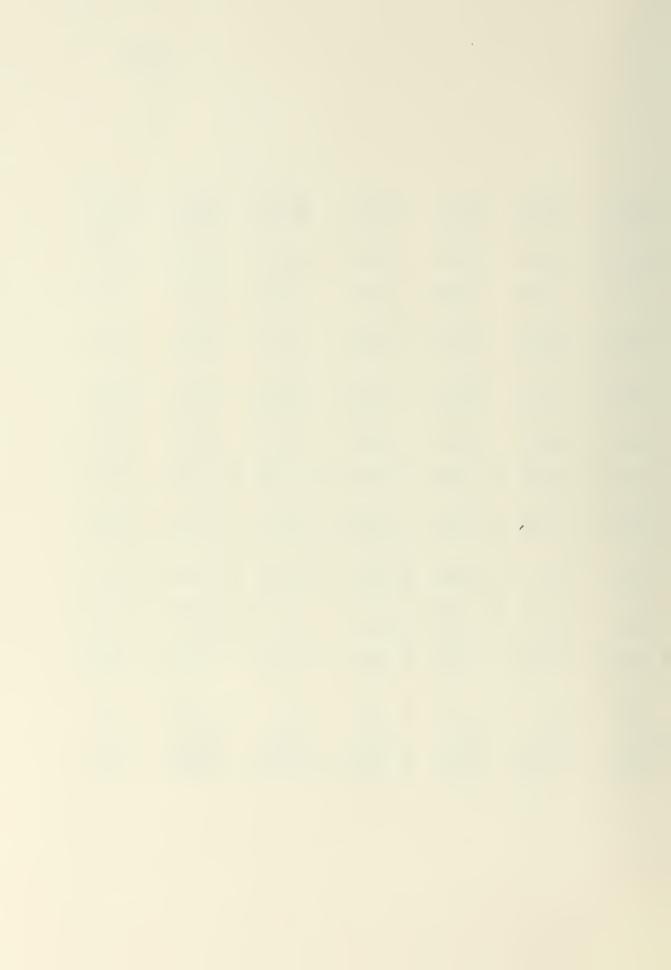
	150.56 3.111 7.0 1.069 3.303	150.58		150.58 0.112 0.0 1.669 3.322		150.58 0.112 0.0 1.067 3.267		15C.58 0.107 0.0 1.064 3.180		153.56 6.164 0.0 1.661 3.083		150.58 0.10 0.0 1.008 2.113
	150.42 0.109 0.0 1.069 3.254	153.82 0.111	3.297	153.82 9.110 0.0 1.009		150.82 0.108 0.0 1.007		150.82 0.105 0.3 1.664 3.132		150.82 C.102 0.0 1.061 3.035		150.32 C.03 C.6 1.05H
	0.0 0.0 1.069 3.193	151. 12	3.236	151.12 0.103 1.069 3.212		151.12 C.1C6 C.C 1.067		151.12 0.103 0.3 1.664 3.371		151.12 C.160 0.0 1.061 2.973		151.12 0.090 () 1.050 2.060
	151.95 0.132 0.3 1.069 3.024	152.34		152.29 6.100 0.0 1.269 2.975		153.38 C.0 C.0 1.067 2.759		153.93 0.064 9.0 1.064 2.499		154.94 C.074 0.0 1.061 2.197		156.02
	107.59	176.95 -0.0u9		164.29 -0.121 0.0 1.059 -3.578		189.41 -0.158 0.0 1.367 -4.689		192.70		194.63		195.56 -0.211 (.3 1.354 -6.250
	179.C4 -0.005 0.0 1.069 -2.515	190.29	1.070	197.65		201.9d -3.247 6.0 1.067 -7.297		204.22 -0.265 0.0 1.064 -7.848		205.03 -0.274 0.0 1.061		201.91 -0.277 C.C.C 1.054 -8.192
3 PASS	220.06 -0.373 0.0 1.009 -11.158	3 PASS 224.03 -0.441	1.070 -12.996 3 PASS	232.56 -0.463 0.0 1.069 -13.639	3 PASS	232.1d -0.463 0.0 1.067 -13.650	J PASS	230.53	3 PASS	227.85 -0.437 0.0 1.061 -12.863	3 PASS	224.79 -0.416 C.0 1.058
EPFECT	250.94 -0.596 0.0 1.069	EFFECT 254.36 -0.619	. 236 ECT	252.62 -0.667 0.0 1.069 -17.062	FFECT	248.78 -0.581 C.0 1.067 -17.104	EPFECT	244.12 -0.550 0.0 1.004	EFFECT	139.24 0.0 1.001 15.276	LDESAT	234.42 -0.407 C.0 1.053
MULTI-PAUS	205.11 -0.00 1.00 1.065 -20.813	316.77 240.20 -1.079 -0.008	070 1.070 1.070 1 967 -11.078 -23.684 -18 INVOLVE RULTI-FASS EFF	72.58 -0.753 1.069 22.389	AULII-PASS EFFECT	64.58 -0.696 0.0 1.067 20.448	INVOLVE RULTI-PASS EPFECT	273, 30 258,92 6 -0,763 -0,643 10 0,0 0,0 1,064 1,064 16 -22,182 -18,910	INVOLVE NULTI-PASS EFFECT	356.00 263.00 249.78 2 -1.393 -0.691 -0.595 -5.971 0.0 0.0 1.661 1.061 1.061	INVOLVE AULTI-PASS EPFECT	254.20 243.24 -0.630 -0.551 6.0 c.5 11.054 -15.221
fall	337.86 -1.239 0.0 1.069 -36.028	INVOLVE 699 34 316.77 714 -1.079 077 0.3	1.070 -31.478 -31.478	299.53 -0.952 0.0 1.069 -27.822	INVOLVE RU	205.28 -0.048 1.007 -24.843	DE ZUIC	273.30 -0.763 0.0 1.064 -22.382	OLVE AU	263.0h -0.691 0.0 1.061 -20.307	UN SVIC	254.20 -3.630 0.0 1.054 -10.534
TRACEA	805.20 -5.099 -9.262 107.076	E48.38	1.070 116.967 1NC	542.59 299.51 2 -2.844 -0.952 -7.301 0.0 1.009 1	ANI	463.71 205.20 2 -2.21.21.2 -0.048 -0.0 1.067 1.067 1.007	INV	403.42 -1.746 -6.310 1.004	INAC	35c.08 -1.393 -5.971 1.001	JANT	319.40 -1.112 -5.708 1.058
00.04	TEMPERATURE MECH. SIGAIN PLASZIC SIGAIN TOTAL SIGAIN STRESS	TIML* 50.00 TEMPERATURE MECH. SCHAIN	S GRAIN S 60.03	TERPERATURE MECH. STRAIM PLASIC SFRAIM TOTAL STRAIM STREES	73.00	TEMPERATURE RECH. STRAIM PLASIIC STRAIM TOTAL STRAIM STRESS	40.00	TEMBERATURE EEGG: SIRAIN PLASIIC SIRAIN TOTAL SURAIN STREES	90.03	TEMPERATURE MECH. STRAIM PLASIAC STRAIM STRESS	100.00	TEXL SAFURE FLECH. SAFAIN PLANFIC SAFAIN TOTAL SAFAIN STRESS
TIRE	RECH. PLASE TOTAL STRES	TIBLS TENPEL NECH.	TOTAL STRESS TIRES	TERPE PLASE TOTAL STRES	RITA	TEMPE PLASE FOTAL STRFS	TIME	TEAPER PLASE TOTAL STRESS	10 10 10 10 10 10 10 10 10 10 10 10 10 1	TEMPE MECH. PLASI TOTAL STRES	# G 	TENTERAL FLASFIC TOTAL SE STREET



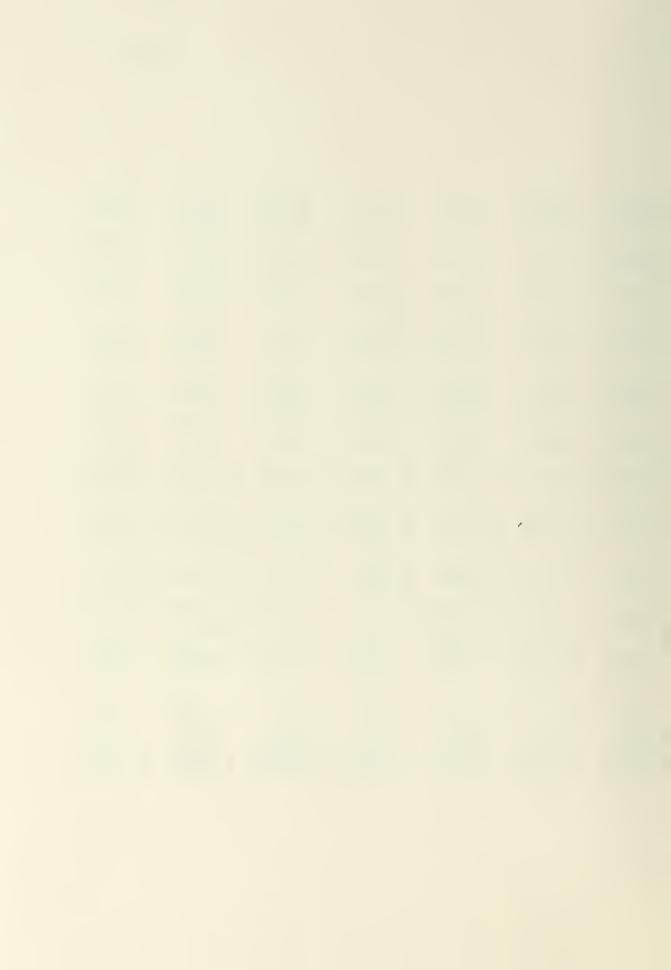
	150.56 3.082 C.C 1.339 2.436		150.58 0.065 0.0 1.023 1.914		150.58 C.C.51 C.C. 1.008 1.506		150.59 0.038 0.0 0.0 1.133		150.61 0.628 0.0 0.945 0.623		150.64		150.03 0.0011 0.000 0.000 0.0010
	150.82 0.040 0.05 1.03¥ 2.387		153.83		150.87		150.94 0.03c 0.0 0.0 1.0c2	ju-e	151.03		1.151.13 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		151.72 0.438 0.970 0.232
	151.23 0.077 0.0 1.039 2.303		151.57 6.058 0.0 1.023		152.22		152.67 0.324 0.5 3.996		152.36.00.0		153.11		153.13 -0.005 C.6 0.973 -0.154
	160.72 0.013 C.0 1.039 0.374		162.95 -C.C20 0.0 1.C23 -C.582		163.29 -0.030 (.00 1.008 -1.079		162.63 -0.044 C.0 0.996 -1.315		161.54 -0.047 0.0 0.985 -1.399		160.32 -C.047 0.0 0.977 -1.465		159.13 -0.046 6.0 C.973 -1.374
	192.83 -0.210 0.0 1.039 -6.224		186.42 -0.142 0.0 1.023 -5.400		140.20 -0.153 0.0 1.008 -4.544		174.86 -0.129 0.0 0.996 -1.816		170.49 -6.109 0.0 6.985 -3.227		166.97 -C.Cy3 0.0 0.977 -2.761		164.14 -0.003 6.0 C.970 -2.390
	158.30 -0.249 C.0 1.039 -7.354		183.79 -0.266 0.0 1.023 -6.095		182.38 -0.168 0.0 1.338 -4.993		176.32 -0.139 0.0 0.996 -4.117		171.53 -0.116 0.0 0.985 -3.435		167.69 -0.094 C.C 0.977 -2.909		164.68 -0.034 0.0 C.970 -2.504
3 PASS	208.92 -0.324 6.0 1.039 -9.567	3 PASS	196.35	a PASS	146.33 -0.146 0.0 1.008 -5.006	3 PASS	174.93 -0.357 0.0 0.996 -4.053	3 PASS	171.29	3 PASS	164.96 -0.107 0.0 0.977 -3.168	3 PASS	165.59
EPFZCI	213.71 -0.358 C.0 1.039	EPFECT	194.77 -0.269 0.0 1.023 -7.954	PPECT.	188.62 -0.208 0.6 1.008 -6.157	EPFECT	183.52 -3.164 0.0 0.996 -4.876	EFFECT	174.04 -0.133 0.0 0.945 -3.954	LVFECT	169.46 -0.110 0.0 0.977 -3.275	LPFECT	-0.093 0.0 0.976 -2.768
MULTI-PASS	217.92 -0.387 6.0 1.039	INVOLVE RULTI-PASS	201.12 -0.285 0.0 1.023 -0.441	INVOLVE HULTI-PASS	185.47 -0.238 1.308 1.308	INVOLVE MULTI-PASS	181.94 -0.37 0.0 0.9996 -5.066	INVOLVE AULTI-FASS	174.66 -0.136 0.0 0.9465 -4.082	INVOLVE HULTI-PASS	169.91 -0.113 0.977 -3.363	INVOLVE MULTI-PASS	166.24 0.0395 0.030 0.970 -2.832
INVOLVE RUI	222.96 -0.423 0.0 1.039 -12.498	LVE AU	203.67	LVE HUI	191.13 -0.229 0.0 1.00d -6.799	LV& MUI	182.01 -0.178 0.0 0.996 -5.286	LVE AUT	175.38 -0.143 0.0 0.985 -4.230	LVE HUI	170.42 -0.117 0.0 0.977 -3.467	LVE AU	100.093 0.0 0.0 0.0 0.03 0.03 0.03 0.03
INVO	210.47 222.96 -0.377 -0.423 -0.029 0.0 1.039 1.039 137.425 -12.498	DART	177.74 -0.122 -4.799 1.023 130.007	DANI	162.00 -0.027 -4.716 1.30H	DANT	155.31 182.01 0.006 -0.176 -4.716 0.0 0.396 0.996 140.473 -5.286	DANT	152.39 -4.716 0.945 140.803	INVC	151.09 0.016 -4.716 0.977 14C.832	THAC	150.50 0.0313 -4.716 141.748
TINE= 150.00	TERPERATURE ALCH. SIRAIN PLASIIC SIRAIN ICIAL SIRAIN SIRESS	TIME= 200.00	TENPERATURE RECH: STRAIM PLASTIC STRAIN TOTAL STRAIN STRESS	TIME= 250.00	TENDERATURE MECH. SIMAIN PLASFIC STRAIN TOTAL SPRAIR STPRAS	TIME: 130.60	TENPERATURE MECH: SIRALA PLASTIC SIRALM TOTAL SIRALN STRESS	TIEL= 350.30	TEMPERATURE MECH: STRAIL PLASTIC STRAIN TOTAL SIRAIN STREIS	TIME #00.00	TEMPERATURE MECH. SERAIN PLASSIC SIRAIN TOTAL STRAIN STRESS	TIME= 450.30	TENEGRADUSE RECHO STRAIN PERSING STRAIN TOTAL STRAIN



	150.73 0.00 0.0 0.964 0.150		150.77 C.0CO 0.0 0.953 C.CC1		155.61 -0.00+ C.0 0.955 -C.130		150,85 -0.00d 0.0 0.952 -0.231		153.47 -C.011 0.0 0.949 -0.322		150.89 -0.013 0.546 -0.397		150.91 -0.015 0.0 0.944 -0.459
	151.29 0.00 0.0 0.90 0.904 0.341		151.16		151.37 -0.336 0.0 0.955 -0.955		151.37 -0.011 0.0 0.952 -0.336		151.35 -0.614 6.0 0.949 -0.414		151.32 -0.016 6.0 0.946 -0.485		151.29 -C.018 0.0 0.944 -0.548
	153.36		152.53		152.78 -0.018 C.C 0.955 -0.529		152.61 -0.020 0.952 -0.589		152.44 -C.022 0.0 0.949 -C.041		152.24 -0.023 0.9 0.946 -0.683		152.13 -0.524 0.0 0.3444 -0.739
	158.04 -0.045 0.0 0.964 -1.328		157.07 -0.043 5.0 6.959 -1.278		150.24		155,53 -0.643 0.952 -1.183		154.92 -0.038 0.0 0.949		154.42 -3.037 6.0 0.946 -1.112		151.93 -0.037 0.0 C.944 -1.086
	161.88 -6.071 0.0 0.954 -2.113		160.06 -0.083 6.0 0.959 -1.845		158.60 -3.358 0.0 0.955 -1.712		157.43 -6.053 0.0 0.452 -1.567		156.49 -0.049 C.0 0.949 -1.461		155.72 -0.046 0.0 0.946 -1.377		155.13
	162.27 -C.074 0.3 0.964 -2.190		160.16 -0.065 0.00 0.959		158.84 -0.059 0.0 0.955 -1.759		157.62 -0.054 0.0 6.952 -1.604		156.64 -0.050 C.0 0.949 -1.491		155.85 -0.047 0.0 0.946 -1.402		155.21 -2.345 0.0 f.944 -1.333
3 PASS	162.96 -C.076 0.0 0.0 0.464 -2.329	3 PASS	160.46	3 PASS	159.24 -0.062 3.0 0.955 -1.841	3 PASS	157.93 -0.656 3.3 0.952 -1.669	3 PASS	156.89 -0.052 C.0 3.949 -1.543	3 PASS	156.36 -0.343 0.3 0.946 -1.445	3 PASS	155.39 -0.046 0.0 0.744 -1.369
EFF ECT	163.23 -0.080 0.0 0.964 -2.386	FFECT	161.69 -0.07 0.0 0.959 -2.095	EFFECT	159.40 -3.063 0.0 0.955 -1.874	EPPECT	158.06 -0.057 0.0 0.452 -1.695	EPPECI	157.00 -0.053 0.0 0.949 -1.564	EFFECT	156.14 -0.049 0.0 0.946	LFFECT	155.46
TI-PASS	163.46 -0.082 0.0 0.964 -2.433	II-PASS	161.27 -0.072 0.0 0.959 -2.131	TI-P255	159.54 0.0 0.95 0.955	KULTI-PASS	158.17 -6.058 0.0 0.952 -1.717	TI-PASS	157.08 -0.053 0.0 0.949	SULTI-FASS	156.21 -0.050 0.0 0.546 -1.477	MULTI-PASS	155.12 -0.647 0.0 0.944 -1.396
LVE BULT	163.73 -0.0du 0.0 0.y6u -2.486	INVOLVE HULTI-PASS	101.46 -0.07 C.0 0.959 -2.171	INVOLVE RULTI-PASS	159.49 -0.365 0.0 0.955 -1.932		158.29 -0.059 0.0 0.952	INVOLVE AULTI-PASS	157.18 -0.054 6.0 0.949 -1.601		156. 29 -3.05 0.0 6.94 -1.49	TAF WHT	155.554 -0.047 0.0 0.444 -1.410
INVOLVE	150. 23 -6. 716 -3. 964 140. 633	CART	159.20 0.334 -4.716 0.959 140.479	I N V C	15c. 13 0.000 -4.716 C.955 140. 183	INVCLVE	150.07 -0.062 -4.700 6.952 139.825	INVO	150.63 -0.305 -4.700 0.949 139.746	INVOLVE	156.02 -0.337 -4.703 0.946 139.678	INVOLVE	150.01 -0.009 -4.700 -1.944
TIME= 530.03	TERPERATURE SECH SIRAIN PLASIEC SIRAIN FOIRE SEARIN STREES	TIME \$50.00	TERFERATURE BLCH. SEARIN PLASFIC STRAIN TOFAL SERAIN STREIS	TIRE= 033.00	TERPERATURE MECH. SETALS PLASIEC STRAIN TOTAL STRAIN STRESS	TIML= 650.33	TENPERATHEL MECH. STRAIG STRAIG STRAIG STRAIG STRAIG STRAIG STRAIG STRAIG	FINE 700.00	TEMPERATURE MECH. STRAIN PLASTIC SIPAIN TOLAL SIRAIN STRESS	TIME= 750.00	TEMPERATURE RECH. SIPALA PLASTIC SIRAIN TOTAL SIRAIN STRUSS	TIME= 330.33	TLYPLETIGGS MECH. STRAIM PLASTIC STRAIN FOTAL STRAIN



150.90 -0.01 0.0 0.943 -0.504		150.89 -0.018 0.941 -0.540		150.88 -C.019 0.0 -0.949 -0.579		150.87 - 3.020 6.0 8.939 - 0.605		150.47 -0.020 0.03 0.934 -0.605		150.47 -0.030 0.03 0.930 -0.668		.15C.67 -0.030 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
_		151.29 -0.021 0.941 -0.028		151.26 -0.922 0.0 0.940 -0.655		151.22		151.22 -0.023 0.0 0.539 -0.677		151.22 -C.032 C.0 0.930 -C.96C		151.22
-		151.48 -0.025 C.C 0.941 -0.740		v -		151.67		_		151.67 -0.035 0.930 -1.051		151.67 -0.035 6.0 0.730 -1.051
-		152.34 -0.035 0.0 0.941 -1.043				152.90 -0.034 9.0 9.939 -1.017		152.90 -0.034 0.0 0.933 -1.017		152.90		152.90 -0.044 0.0 0.930 -1.330
_		_		—		153.60 -0.039 0.0 0.934 -1.159		153.63 -0.039 0.0 0.939 -1.159		153.60 -0.048 C.0 0.933 -1.442		153.60 -0.34d 0.3 r.930 -1.442
-		_				-		153.67 -0.039 0.0 0.939		153.67 -0.049 0.6 0.930 -1.455		153.67 -0.349 0.3 0.930 -1.455
-	J PASS	154.11	J PASS	- pro	3 PASS	153.70	3 PASS	153.78 -0.040 0.0 0.240 -1.195	4 PASS	153.78	4 PASS	153.78 0.0 0.930 -1.477
154.91 -0.044 0.943 -1.322	EFFECT	154.47 -0.043 5.0 (.941	1.03 4.42	154.11 -0.041 0.0 0.940 -1.233	EFFECT	153.82 -0.040 0.6 0.939 -1.204	103443	153.82 -0.040 0.00 0.939 -1.204	EPFECT	153.82 -0.050 C.L 0.930 -1.406	ZPFECT	153.82 -0.050 0.0 0.936 -1.486
154.96	TI-PASS	154.51 -0.043 v.0 c.941 -1.280	TI-PASS	154.15 -0.042 0.0 0.940 -1.241	TI-PASS	153.46	TI-PASS	153.86 -0.041 0.0 6.439 -1.211	TI-PASS	153.86 -0.050 0.0 0.930 -1.494	TI-PASS	153.86
155.02 -0.045 -0.045 0.943 -1.344	TAE HAT	154.56 -0.043 0.0 0.941 -1.240	LVE RUL	154.19 -0.042 0.0 6.943 -1.250	TAZ HOI	153.90 -0.041 6.0 0.939 -1.219	LVE MUL	-		153.90 -0.053 0.0 0.940 -1.502	LVE AUI	153, 90 -0, 050 0, 0 0, 930 -1, 502
15C.00 -0.011 -4.7C0 0.943 1.9.571	DANI	150.00 -0.012 -4.700 0.941 139.533	INVO	155.00 -0.014 -4.703 6.940 139.498	DART	150.00 -0.010 -4.700 0.939 139.469	THAC	15¢.0¢ -0.014 -4.700 0.939 139.469	INVC	15C. 0C -0. 024 -4. 7CC 0. 930 139. 147	INVO	156.00 -0.324 -4.700 0.930
TEMPERATURE RECH. STRALM PLASTIC STRALM TOTAL SIRALM STRESS	TIME 400.00	TEMPERATHRE RECH. SIRAIN PLASTIC STRAIN TOTAL SIRAIN SIRESS	EIME= 950.03	TEMPERATURE NECH - SIRAIN PLASIIC STRAIN TOTAL SIRAIN	TINE= 1000.00	TEMPERATURE MECH. SCHALS PLASSIC STRAIN STREUS	TIAE= 1000.00	TEMPLAA LURZ MECH. STRAIN PLASIIC STRAIN TOIAL SIRAIN SIRESS	IIME= 0.0	TEMPERACHRE HECH. STRAIN PLASIIC SIRAIN TOIAL SIRAIN STRESS	TIRE= 1.03	TEMPEPATURE MECH. STRAIN PLASTIC STRAIN TCTAL STPAIN SIRES
	15C.CO 155.02 154.96 184.91 154.85 154.69 154.60 153.64 152.00 151.25 1 1.0.015 -0.045 -0.045 -0.044 -0.044 -0.034 -0.034 -0.035 -0.019 1.3 -0.045 -0.035 -0.019 1.3 -0.035 -0.03	15C.CO 155.02 154.96 194.91 154.85 154.69 154.60 153.69 152.00 151.25 1 -4.701 -0.045 -0.045 -0.049 -0.044 -0.042 -0.042 -0.045 -0.035 -0.019 13 -4.702 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 139.571 -1.349 -1.333 -1.322 -1.310 -1.279 -1.260 -1.065 -0.732 -0.500	15C.CO 155.02 154.96 154.91 154.45 154.60 153.64 152.00 151.25 -1,011 -0.045 -0.046 -0.044 -0.043 -0.042 -0.042 -0.036 -0.05 -4,7CC 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 159.571 -1.344 -1.333 -1.322 -1.310 -1.279 -1.260 -1.Cb5 -0.732 -C.55C 15C.CO 154.56 154.51 154.47 154.41 154.28 154.20 155.34 151.38 151.29 -0.012 -0.033 -0.043 -0.043 -0.042 -0.041 -0.041 -0.035 -0.025 -0.021 -0.014 -0.039 -0.043 -0.043 -0.042 -0.041 0.041 0.035 -0.025 -0.021 -0.014 -0.039 -0.043 -0.043 -0.042 -0.041 0.041 0.035 -0.025 -0.021 -0.041 C.941 C.941 C.941 0.941 0.941 0.941 0.941 0.941	15C.CO 155.02 154.96 154.91 154.45 154.69 153.64 152.00 151.25 -1,011 -0.045 -0.044 -0.044 -0.044 -0.042 -0.046 -0.036 -0.025 -0.019 -4,7CC 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 159.571 -1.344 -1.332 -1.310 -1.279 -1.260 -1.C65 -0.732 -C.50C 15C.00 154.55 154.51 154.47 154.41 154.28 154.20 153.34 151.08 151.27 -0.012 -0.043 -0.043 -0.043 -0.042 0.041 -0.041 0.943 151.08 151.27 -0.012 -0.043 -0.043 -0.043 -0.042 0.041 0.943	15C.CO 155.02 154.96 154.91 154.85 154.69 154.60 153.64 152.00 151.25 -4.7C 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	15C.CO 155.02 154.96 154.91 154.45 154.69 154.60 153.64 152.00 151.25 -4.7CC 5.0 0.0 0.0 0.0 0.0 0.0 0.0 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.944 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.944 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 0.943 15C.CO 154.50 154.51 154.47 154.41 154.20 15.1.44 151.48 151.23 -0.012 -0.043 -0.043 -0.043 -0.042 -0.041 -0.041 -0.043 -0.025 -0.025 0.941 0.943 -0.043 -0.043 -0.042 -0.041 0.941 0.941 0.941 0.941 139.533 -1.290 -1.284 1.271 -1.260 -1.232 -1.216 -1.043 -0.744 0.094 139.533 -1.290 -1.284 1.371 154.00 153.94 153.87 153.13 151.77 151.26 -0.040 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	15C. 00 155.02 154.36 154.39 154.45 154.69 154.60 153.64 152.20 151.25 -0.019 -0.0045 -0.0048 -0.0049 -0.009 -0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	194.571 -0.045 -0.044 -0.044 -0.044 -0.044 -0.045 -0.045 -0.021 -0.015 -0.021 -0.022 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.022 -0.021 -0.021 -0.021 -0.022 -0.022 -0.022 -0.022 -0.021 -0.021 -0.022 -	156,00 154,56 154,96 154,91 154,48 159,469 153,40 152,30 151,25 150,441 0.045 -0.045 -0.046 0.044 0.034 -0.0342 -0.0342 -0.0345 -0.035 -0.035 -0.045 0.044 0.034 0.0341 0.	134, 571 -1.344 -1.345 154.45 154.45 154.40 152.70 151.25 -0.075.02 -0.079 -0.044 -0.044 -0.044 -0.045 -0.046 -0.024 -0.045 -0.0	155.00 155.02 154.96 158.91 159.05 158.60 152.00 151.25 -1.01 10.020 0.040 0.040 0.000 0.00 0.00 0.00 0	15.00 155.02 155.98 153.91 153.45 154.85 154.80 153.64 152.00 157.02 157.09 157.02 157.00 157.02 157.00 157.02 157.00 157.02 157.00 157.02 157.00 157.02 157.00 157



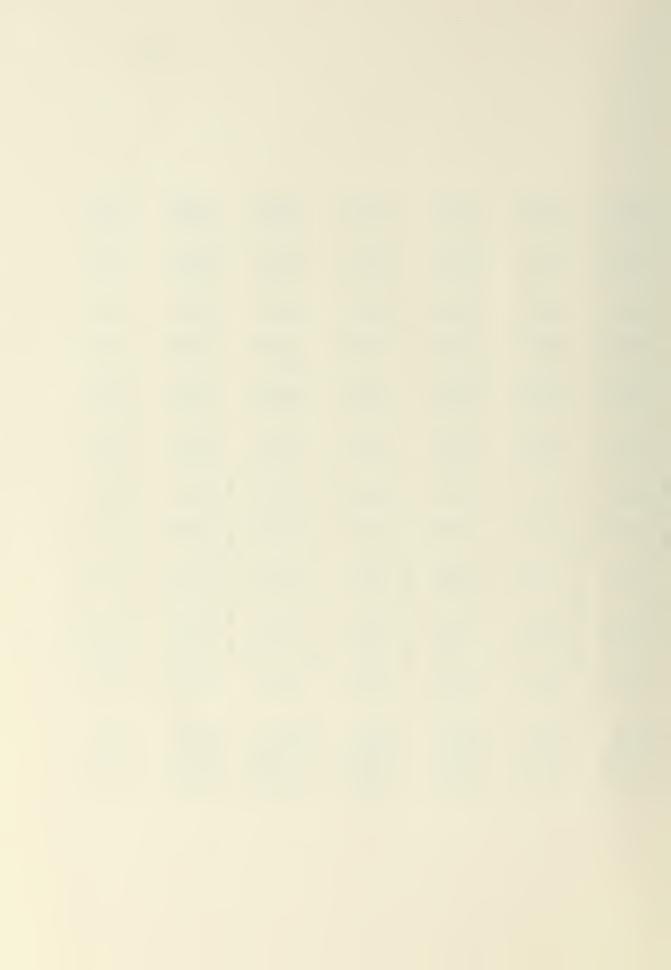
	150.67 -0.030 0.0 0.930 -0.930	. 47	0.0 0.930 -0.808		155.37 -0.030 0.0	e d B		020.	948 948		150.87 -0.630 6.6	. 930		150.47 -0.030 0.0 0.930 -0.887		50.87 -C.C29 0.07 C.941 -0.863
	-	•						150.8			-			-		V-1
	151.24 -0.932 0.9 0.930 -0.560	*	0.94.0-		151.22				0.90.0-		151.22			151.22		151.22 -0.531 0.0 0.431 -0.935
	151.67 -0.035 0.0 0.9 0.9 -1.051	151.67	0.930		151.67	-1.051		151.67	0.933		151.67 -0.335 0.0	0.930		151.67 -0.035 0.930 -1.051		151.67 -0.03 0.0 0.31 -1.027
	152.90 -0.044 0.0 0.930 -1.300	5 -			152.90			152.90	0.930		152.90	0.930		152.90 -0.044 5.0 0.930 -1.299		152.90 -0.043 0.0 9.931 -1.275
	153.60		0.0		153.60	-1.442		153.00	0.930		153.60	0.930		153.60		153.60
	153.67	153.67	0.0 0.930 -1.455		153.67			153.67			153.67			153.67 -0.343 0.0 0.930 -1.454		153.07 -0.046 0.0 0.931 -1.430
4 PASS	153.78 -0.050 0.0 0.430 -1.477	-	0.0	4 PASS	153.78		4 PASS	153.78	0.930	4 PASS	_		4 PASS	153.78 -0.050 0.0 0.930 -1.477	4 PASS	153.78 -C.049 0.0 0.931 -1.453
EPF ECT	153.82 -0.05C 0.0 6.93C -1.486	LFFECT 153.82 -0.050		EFFECT	153.82 -0.050		EFFECT	153.82 -0.050		E C T	-	0.930	EPPECT	153.82 -0.050 0.0 6.936 -1.486	EPFRCT	153.82
RULTI-PASS	153.36	153.86 -0.050	0.0	RULTI-PASS	153.46		TI-PASS	153.86		II-PASS	-	0.930	TI-PASS	153.86	KULTI-PASS	152.37
INVCLVE RUI	153.90 -0.050 0.0 0.933 -1.502	153.	200-	INVOLVE MUI	153.90		INVCLVE MULTI-PASS	153.40	-1.502	INVOLVE KULTI-PASS	153.90 -0.050 C.0		INVOLVE MULTI-PASS	153.92 -0.051 0.0 0.940 -1.507	INA SATOANI	154.10 -0.051 0.0 0.941 -1.543
DANT	150.00 -0.730 0.730 139.167	IN VO 150.00 -0.024	-4.760 0.930 139.187	DANT	150.00	139.187	DA KT	150.00	0. 930	15,10	150.03	0.930	INVC	156.49 -0.027 -4.700 0.930 139.081	DANT	164. 01 -0.123 -4.730 6.331
2.03	TEXTERATURE FECH. SIRAIN PLASTIC SIRAIN FOTAL STRAIN SIJESS	3.00 . SAFURE STRAIN	C SERAIN SERAIN	00 - 4	TEMPTRATURE NECH. SCRAIN PLASTIC STRAIM		5.30	TEMPERATURE MECH: SERAIN PLASFIC STRAEN		. 00.9	TEMPERATURE MECH. STRAIN PLASTIC STRAIN	STRAIN	7.00	TERPERATURE MECH. SIRAIN PLASTIC SIRAIN TOTAL STRAIN STRESS	6.13	TENEDRA PURE NECH - STATIS PLASITC STRAIN STATIS
TIME	TEXPERATURE RECH. SERNI PLASTIC SER FOTAL STRAI STRESS	TIME= 3 TEMPERATUR MECH. STRA	PLASTIC TOFAL SE STRESS	# 30 54	TEMPTRATURE NECH SCHOL SCHAL	STREET	TIMEs	TEMPER MECH.	TOTAL	TIBES	TEMPER MECH. PLASTI	TOTAL	TIME	TECH-SENTU MECH-SEN PLASTIC S TOTAL STA	TIRL	TLASTA MECH. 31 PLASTIC TOTAL ST STATS



-	-6.012 0.947 -0.367		153.67 0.090 0.0 0.0 1.050 2.677		150.87 0.10 0.0 1.060 2.964		150.87 7.116 0.0 1.075 3.441		150.87 0.051 0.0 1.011		150.87 0.145 0.0 1.105		150-87 0-157 0-3 1-110
151.22	-C.015 0.04 0.947		151.22		151.22		151.22 0.113 C.0 1.075 3.368		151.22		151.22 0.143 0.0 1.105		151.22 0.154 0.0 1.116
151.	0.947		151.67 0.0 0.0 1.050 2.513		151.67 0.0 0.0 1.060		151.67		151.67 0.045 0.0		151.67 0.140 0.0 1.165		151.47 7.151 0.0 1.116 4.562
_	-C.026 0.C 0.947 -0.779		152.90 0.076 0.0 1.053 2.264		152.90 0.00 0.00 1.060 1.060		152.90 C.102 G.0 1.075 3.628		152.90		152.90 0.132 0.0 1.105 3.913		152.93 3.143 0.0 1.110 4.253
_	0.947		153.60 0.071 6.0 1.050 2.122		153.60 . 0.062 0.0 1.060 2.429		153.60 0.097 6.0 1.075 2.005		153.60 0.032 0.0 1.011 0.460		153.60 0.127 0.0 1.105 3.773		153.61 0.138 0.0 1.116
***	0.031		153.67 0.0 1.050 2.108		153.67 6.001 1.069 2.415		153.67 0.097 0.0 1.075 2.872		153.68 0.032 0.0 1.011		153.69 6.126 0.0 1.105		153.73 0.137 0.0 1.110 4.005
-	0.00	4 PASS	153.79 0.070 0.07 1.053 2.083	4 PASS	153.62	# PASS	153.92 0.0 0.0 1.075 2.821	4 PASS	154.14 0.029 0.0 1.011 0.850	W PASS	155.30	u PASS	150.05 C.121 C.C L.110
100	-C.033 0.0 0.947 -0.969	EPPECT	152.90 0.069 6.0 1.050 2.060	EFFECT	154.12 0.678 6.0 1.066 2.324	EPFECT	155.13 0.067 0.0 1.075 2.575	EPPECE	156.75	EFFECT	159-41 0.087 0.0 1-105 2.588	EFFECT	163.16 0.073 (.0 1.116 2.103
	-U.033 0.947 -C.946	RULTI-PASS	154.71	RULTI-PASS	156.65	NULTI-PASS	160.86	RULTI-PASS	167.87 -0.366 0.9 1.011	TI-PASS	177.37	AULTI-PASS	188.47
LVE 157.0	0.055	INVCLVE RUI	169.10 -0.035 1.053	INVOLVE RUI	194.89 -0.232 0.0 1.000 -6.677	INACTAE NUI	241.16 -0.518 0.0 1.075 -15.267	INVOLVE RUI	282.00 -0.881 0.0 1.611	INVOLVE MULTI-PASS	314.41 -1.027 0.0 1.105 -29.953	INACTAE VIII	337.77 -1.191 0.0 1.116 -34.616
DAHI 404.05	-1. 4n3 -4.7.0 0.947 80.444	DANT	2500.00 -17.575 -17.575 -17.575 1.350	INVO	2500.30 -17.565 -17.565 -17.663	THAC	2500.000 - 17.550 - 17.550 0.0	TNAC	2406.70 282.00 -10.807 -0.881 -17.550 0.0 1.611 1.611	DA N I	2500.00 -17.520 -17.520 -17.520 0.0	INAC	2530.33 -17.509 -17.369 1.116 0.0
TIRE 9.00	PLECT. STRAIN PLAUTIC STRAIN TOTAL STRAIN STRESS	. (C°C1 =2%IL	TEXPERATURE FECH. SLABIN PLASTIC STRAIN TOTAL SERAIN STRESS	TIME= 11.00	TERLERATURE RECH. SIBALN PLASTIC SIRALN TOTAL SIRALN SIRESS	12.00 TIMES 12.00	TENTERATURE RECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIME= 13.33	TEMPERATURE RECH. STRAIN PLASTIC SIRAIN TOTAL STRAIN STRESS	CO-MI = 3WIL	TEMPERATURE MECH. STRAIN PLACIE STRAIN FOTAL SPRAIN STPESS	TIME # 15.00	IITTELTATURE AICH, SIRALT PLASTIC SIRALN TCTAL SIMARN STRENS



=======================================	1,034		150.67 0.CH4			153.67				150.07	0.00	1.050			156.87				150.87	1.056	2,942		150.87	1.064	
151.22 0.076	1. JJ B		151.22	1,044		151.22	1,047	2.541		151.22	, o	1.050			151.22	0.0	1.052		151.22	1.058	2.669		151.22	1.004	7
151.67			151.67	1.043		151.67				-		1.053			151.67	2.0	1.052		151.67	1.054	2.177		151.67	1.064	
152.90			152.90			152.90				_		1.050			152.90	0.0	7.052		152.93	1.058	2.528		152.91	1.064	
153.63	1.763		153.65	1.043		153.70				-		1.050			153.80	0.0	1.052		159.13	1.054	1.264		168.70	1.064	
153.00	1.729		153.91	1.043		154.09				154.67	0.0	1.050			155.14	0.0	1.052		-	1.658			180.26		
4 PASS 157.56 0.032		4 PASS	159.55		# PASS	162.01	1.047	6.346	4 PASS	-		1.053		4 PASS	168.32	0.0	1.052	t PASS	201.56	1.058	-7.475	4 PASS	221.90	1.064	
167.88 -3.338		EFFECT	173.35	1.043	EFFECT	179.29	1.047	-3.195	EFFECT	185.44	0.0	1.050		EFFECT	191.60			EPF ECT	230.06	1.058	-14.689		252.19	1.064	9
RULTI-PASS 9 200.16 91 -0.263	1.038	TI-PASS	211.63	1.043	AULTI-PASS	222.37	1.047	-12.142	TI-PASS	232.15	3/3-0-0	1.050		MULTI-PASS	240.65	0.0	1.052	EULTI-PASS	282.00	1.058	-24.408	AULTI-PASS EFFUCT	286,55	1.064	8
353.9	1.038	INVOLVE MULTI-PASS	364.83	1.043	INVOLVE AUL	371.87	1.047	-43.904	INVOLVE RULTI-PASS	176.21	0.0	1.050		INVOLTE AUI	374.66	0.0	1.052	INVOLVE RUI	163.49	1.058	-41.882	INVOLVE AUI	319.09	1.064	
1547.60 -10.516	1.638	CANT	1470.73	1.043	DANI	1402.07	1.047	22.405	DART	1540.00	-13.107	30.077		INAC	1282.53	-12.937	37.807	INVC	874.55	1,058	130.454	INVC	609.28	1.064	
TURE LEALEN	TRAIN	17.00		Z.	18.00	Ť	2		19.60		SESALM	AIN	٠	70°00	TURE	IC STRAIN	TRAIN	30.03	TURE	PLASTIC SERAIN TOTAL SERAIR		40.00	1 Jac	PERSONAL STRAIR	
TERPERATURE	TOTAL STRAIN STRESS	TIME	TEMPURA FURE MECH - STRAIN	PLASFIC STRAL TOTAL STRAIN STAFES	TIMES	TEMPERATURE RECH. SIMAIN	TOTAL SERAL	STRESS	TIME	FERFURATURE	PLASALC	FOTAL STARTS		TIME	TENPONATURE AFCH STRAIN	PLASFIC	STRESS	TIME	TEMPERA KECH. S	PLASFIC TOTAL S	STRES	TIMES	TTYPERALDRE MICH. STRAIN	TOTAL S	



	150.87 0.106 7.0 1.066	150.87 0.106 0.0 1.00 1.00 1.00	150.87 0.104 0.0 1.064 3.095	15C.87 0 101 0.0 1.C61 3.009	150.87 0.0 1.057 2.911	150.87 0.094 0.00 1.054 2.866	150.87 0.076 0.0 1.036 2.260
	151.22 0.104 0.0 1.056 3.094	151.42 0.0 1.005 1.005	151.22 0.102 6.9 1.064 3.022	151.22 0.339 0.5 1.061 2.936	151.22 0.09 1.057 2.839	151.22 0.092 0.0 1.054 2.734	151.22 0.073 0.0 1.036 2.187
	151.67 0.101 0.0 1.966 3.302	151.67 0.160 1.065 2.984	151.67 440.7 10.0 10.0 10.0 10.0 10.0 10.0 10.0 1	151.67 0.096 0.0 1.061 2.445	151.48 0.0 1.057 2.147	151.64 0.0 1.054 2.64 2.64	251.79 0.07 1.036 2.032
	153.03 0.092 0.0 1.066	151.25 0.093 0.0 1.665	154.05 0.082 0.0 1.064	154.90 0.074 0.¢ 1.061 2.189	155.41 0.00 1.057 1.887	156.49 0.054 1.054	161.69 0.032 0.0 1.036 0.059
	178-15 -0.041 0.0 1.060 -2.409	185.44 -0.13 3.06 -3.065	150.63 -0.170 0.0 1.064 -5.050	193.45 0.196 0.0 1.001 -5.817	195.82 -0.213 0.0 1.057 -6.114	196.75 -0.223 0.0 1.054 -6.611	194.02 -0.222 C.C 1.036 -0.588
	191.51	194.30 -0.227 0.0 1.065 -6.700	203.20 -0.259 0.0 1.064 -7.063	205.43 -0.278 0.0 1.061 -8.212	236.25 -0.287 0.0 1.057 -6.479	206.12 -0.209 0.0 1.054 -8.558	199.51 -0.261 0.0 1.036 -7.727
4 PASS	230.67 -0.454 5.0 1.000 -13.375	4 PASS -0.4/5 0.0 133 -14.013	233.61 -0.476 6.0 1.364 -14.023	4 PASS 231.77 -0.465 1.061	229 PASS 229 0.0 0.0 1.057 1.057	4 PASS 226.03 -0.431 6.0 1.054	210.17 -0.336 0.0 1.036 -9.944
EPFEC1	255.6C -0.632 0.5 1.666	CJ IO O	250.02 -0.594 6.0 1.064	Z#FECT 245.37 -0.563 10.061 10.061 -16.583	### ECT ## ECT #	235.68 -0.530 0.0 1.054	.14.94 0.0 1.036
MULTI-PASS	281.44 -0.021 0.0 1.066 -24.067	.TI-7A3S 273.82 -0.766 0.0 1.965	RULTI-PASS 55 265.84 .861 -0.709 0 0.0 .064 1.064	258.17 -0.656 0.0 1.001		244.50 244.50 -0.564 -1.054 -1.054	**************************************
LYE	318.02 281.44 -1.073 -0.021 0.0 0.3 1.066 1.066 -31.861 -24.067	INVOLVE hULTI-FASS EFFECT 97 JULY 271.84 253.87 479 -0.965 -0.766 -0.62 976 U.0 U.0 U.0 0.0 U.0 0.0 U.0 255 1.065 1.065 1.06 276 -28.203 -22.467 -10.23	286- -0 -0 -25	LVE 274 274 0 0 0 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	IMVOLVE AULTI-PASS 1 79 264.33 251.04 4 371 -0.704 -0.608 952 0.0 0.3 057 1.057 1.057	LNVOLVE NULTI-PASS EFFECT 2C 255.47 244.50 235.6U 144 -0.643 -0.554 -0.501 734 0.0 6.0 0.0 654 1.054 1.054 1.054 845 -18.916 -18.500 -14.74	224 224 -0 -0 -121
INVC	576.39 -3.118 -7.546 1.006 123.305	12.276	1 129, 946 - 25, 129, 129, 946 - 25, 129, 129, 129, 129, 129, 129, 129, 129	INVOLVE -1.66.1 -0 -6.249 0 1.601 1	188 VOI -1.379 -5.952 1.057 132.890	123.2C -1.144 -5.734 133.845	231.42 -6.488 -5.130 1.036
\$6.39	TESPIRATUSE RECU: SESAIN PLASEIC SESAIN ICTAL SESAIN STRESS	TERE= 60.00 TEMPLANTUAL SECH. STANIN PLASTIC STANIN TOTAL STANIN	70.00 TIURE TIARIN	TEMES 30.30 TEMPERATURE RECH. SERALM PLASTIC SERALM TOTAL STRAIM	CTTCEE COLUMN CTTCEE COLUMN CTTCEE CT	TIME 100.00 TEMPERATURE MECH. STRAIN PLASTIC STRAIN FOLAL STRAIN	TINE= 150.00 TENDERATURE AECH. STRAIN FLATIC STRAIN TOTAL SCRAIN STRASS
TIBES	TERPIRAT RECU-SI PLASELU TOTAL SI STRESS	TEMPLHAFULL MECH. STRAIN PLASIC STRAIN TOTAL STRAIN	TIRES 10.00 TEMPERATURE RECH. STRAIN PLASIC STRAIN TOTAL STRAIN STRESS	# # # # # # # # # # # # # # # # # # #	TIME= 90.00 TEMPERATORE RECH. SIMAIN PLASIC STRAIN STRESS	TINE 100. TEMPERATURE RECH. STRAI PLASTIC SIR TOIAL SIRAI	TEME= 150.0 TEMPEHATURE dECH. STRALM TOTAL STRAIN STRESS



150.87 0.059 0.0 1.019	150.87 0.095 1.004 1.329	150.88 0.032 0.942 0.950	150.90 0.021 0.021 0.981 0.083	150.93 0.0 0.0 C.473	150.97 0.006 0.0 0.966	151.61
151.23 0.350 0.05 1.019	151.27	151.34 0.029 0.029 0.192	151.44 0.018 0.0 0.781	151.54 0.00 0.0 0.973	151.63 0.001 0.0 0.966 0.043	151.70 -0.005 0.0 d.960
152.13 0.050 0.050 1.019	152.78	153.23 0.00 0.00 0.192 0.474	153.52 0.00 0.0 0.961 0.102	153.66 -0.00 0.0 0.0 0.073	153.68 -C.313 C.C 0.966	153.0.2 -0.0 -0.0 -0.0 -0.960 -0.960
163.92 -0.030 0.0 1.019	164.26 -0.047 0.0 1.004 -1.395	163.60 -0.055 0.0 0.492 -1.636	162.50 -0.058 0.0 0.981	161.29 -0.054 0.0 0.973	160.10 -C.057 0.0 0.966 -1.647	-0.055 0.0 0.0 0.160 -1.602
187.62 -0.195 -0.195 -5.768	181.33 -0.165 0.0 1.004 -4.907	176.05 -0.141 6.0 0.992 -4.186	171.69 -0.121 6.0 0.541 -3.602	168.17 -0.105 0.0 0.973 -3.122	165.35 -0.093 0.0 0.966 -2.757	163.0d - 0.0d3 0.0 0.960 - 2.472
191.01 -0.218 0.0 1.019 -6.467	183.60 -0.141 0.0 1.004 -5.362	177.55 -0.151 0.0 0.492 -4.492	172.72 -0.126 0.6 0.981	168.92 -0.110 0.0 6.973 -3.274	165.90 -0.097 0.0 0.966 -2.669	163.50 -0.046 0.0 0.0 -2.550
4 PASS 197.30 -0.262 0.017	# PASS -0.209 0.0 1.004 -6.145	4 PASS 183-19 -0-170 0-9-2 -5-03-8	4 PASS -0.1411 0.0 0.0 0.0 0.188	170.22 170.22 1 - 6.114 1 0 0.47 4	4 PASS -0.45 -0.103 0.0 0.0 -3.0e5	4 PASS 164.22 -0.091 0.900 -2.703
200.63 -0.262 0.0 1.019 -8.338	189.29 -0.221 0.0 1.604 -6.536	181.29 -0.177 0.0 0.942 -5.262	175.31 -0.146 0.0 0.981 -4.344	170.76 -C.12 0.07 -3.65	167.24 -0.106 C.0 U.966 -3.144	164.51 -0.093 0.0 -2.763
7 264.39 16 -0.298 10 0.0	190.74 -0.231 0.0 1.004 -6.035	184.22 -0.184 0.092 -5.454	175 - PASS -0.151 0.0 0.981	171.21 -6.126 0.0 0.973 -3.743	167.57 167.57 0.0 0.9 0.966 -3.211	164.75 -0.095 -2.00 -2.01 -2.01
235.1 -0.1 -0.0	INVOLVE MULTI-PASS 92 192.44 190.74 093 -0.243 -0.231 775 0.0 0.0 004 1.004 1.004 054 -7.184 -6.435	INVOLVE HULTI-PASS 02 143.41 144.22 037 -0.191 -0.194 727 C.0 0.0 92 0.992 0.992 410 -5.677 -5.454	INVOLVE NULTL-PASS ZFFECT 97 176.68 175.95 175.31 013 -0.156 -0.151 -0.14 706 0.0 941 0.941 0.94 608 -4.625 -4.475 -4.34	171.71 -6.130 0.0 0.973 -3.846	167.94 -0.111 0.0 0.966 -3.287	105.03 -0.097 0.0 0.0 0.0
190.59 -0.215 -4.884 1.019	170.92 -6.093 -4.775 1.054	101.02 -0.037 -4.727 0.92	155.47 -4.706 6.481	153.19 -0.002 -4.698 -4.698 139.708	151.74 0.000 -4.694 139.811	150.46 -0.000 -4.697 567
TEAPERATURE BECH. STRAIN TOTAL STRAIN STRESS	IIME 250.00 TEMPEPATUME MECH. STRAIM PLASIIC STRAIM TOTAL STRAIM SIRES	FLYER SUO.00 TEMPERATURE HECH. SIGALN FLASHIC STRAIM TOTAL SIBALA	TEMPERATURE RECH. SERALM PLASTIC STRALM TOTAL SIRALM STRESS	TIME= 400.00 TEMPERATURE MECH. STRAIM TOTAL STRAIM STRESS	TEMPERATURE RECH. STRAIR FORAL STRAIR STREES	TIME= 500.00 TEMPERATURE AECH. JUHALM PLUTTE STAIM STAINS



151.06 -0.66 0.6 9.955 -0.176	151-10 -C-017 0.951 -0.108	151.13 -0.014 0.0 0.47 -0.41	151.16. -C.C.17 0.0 0.945 -0.569	151.10 -0.020 0.0 0.942 -0.584	151.18 -0.022 0.0 0.949 -0.646	151.16 -c.c2.3 0.0 0.9 td -0.696
151.76 -C.C.11 0.0 0.955 -0.318	151.78 -0.015 0.0 0.951 -0.445	151.77 -0.01H 0.947 -0.547	151.76 -6.02 0.0 0.745 -0.624	1.13 0.023 0.942 -0.696	151.69 -0.025 0.0 0.940 -0.749	151.66 -0.027 0.0 0.948 -0.791
153.49 -0.022 0.955 -0.669	153.34 -3.020 0.0 0.951 -4.761	153.17 -0.026 0.0 6.047	153.00 -0.030 0.00 0.945	152.84 c.c 0.942 -c.922	152.69 -0.032 0.0 0.940	152.56 -0.033 0.0 0.928
158.34 -0.054 0.0 7.955 -1.593	157.21 -0.052 0.051 -1.547	156.49 -0.051 0.0 0.947 -1.505	155.89 -0.049 0.945 -1.468	00000000000000000000000000000000000000	154.96 -0.047 0.0 0.940	154.61 -C. C47 0.0 0.918 -1.389
161.27 -C.C76 0.0 0.955 -2.249	159.81 -0.070 0.0 0.951 -2.675	158.63 -0.065 0.0 0.947 -1.939	157.69 -0.06.2 0.9	156.92 -0.059 0.0 0.942 -1.750	156.31 -0.057 0.0 0.940 -1.684	55.80 0.0 0.0 0.944 1.633
161.59 -C.C78 0.0 0.955 -Z.314	160.06 -0.072 C.0 0.951	158.84 -0.047 0.047 -1.981	157.86 -0.063 0.0 0.915	157.37 -0.06.0 0.0 0.942 -1.780	156.43 -3.057 0.0 0.940	155.92 - c. 35c 0.3 9.434 - 1.656
4 PASS 102.14 -0.082 0.0 0.955	4 PASS 160.50 -0.075 0.951 -2.210	4 PASS 159.20 -0.069 0.947 -2.054	4 IASS -0.00 0.0 0.945 -1.920	157.32 -0.062 0.0 0.942 -1.830	156.059 0.059 0.940 -1.754	# PASS 156.11 -0.057 0.0 0.938 -1.095
102.37 -0.003 0.955 -2.473	160.68 -0.076 0.0 0.951 -2.252	159.34 -0.073 0.6 0.947 -2.083	158.27 -0.660 0.0 0.945	157-42 -0.062 -0.942 -1.850	156.73 -0.060 0.0	156.18 -0.057 0.938
AULTI-PASS 7 162.55 86 -0.004 0.0 155 0.955	166.82 -0.077 0.0 0.951 -2.282		11-LASS 156.17 -0.066 0.0 0.445 -1.972		LHVOLVE RULTL-PASS UB 156.89 156.81 U14 -0.061 -0.060 697 0.0 0.0 94C 0.940 0.94C	156.25 156.25 0.0 0.938 7 -1.723
162.77 -C.C86 0.0 0.955 -2.553	LVE RUL 16C. 99 -0.078 6.0 0.951 -2.316	159.59 -0.072 C.0 0.947	158.48 -0.067 0.0 0.945	157.5% -0.063 C.0 0.942 -1.866	156.89 -0.361 0.00 -1.802	156-12 0.00 0.91
15.53 -0.002 -4.657 -4.657 -4.55 139.747	15C.29 -0.035 -4.697 0.951	15C.35 -0.30y -4.697 0.447	150.21 -0.031 -4.697 6.945	150.13 -0.012 -4.097 139.440	15C.08 -0.014 -4.697 0.94C	IN WO 150.051
TEMPEMATURE RECH. STALM PLASTIC STRAIN TOTAL STRAIN STRESS	TERPERATURE RECH. STRAIM PLASTIC SIRAIM TORAL STRAIM	TIME 650.00 TERPERATURE MECH. SIRAIN PLASIIC STRAIN TOTAL SIRAIN	TIME 700.00 TEMPLRATURE WHOLE STRAIN TOTAL STRAIN	TIME # 750.00 TEMPLPATURE MECH. SIMAIN PLASTIC STRAIM TUTAL STRAIM STRESS	TINE= 400.03 TENPERATURE MCC1. SIRAIN PLASIIC STRAIN TOTAL STRAIN STRESS	TIME= 450.00 TEMBERATURE NECH: STRAIM PLASTIC STRAIR STRESS



	151.1H -0.025 0.0 0.937 -0.733		151.17 -0.026 0.0 0.535 -0.766		151.15 -0.027 0.0 0.935 -0.792		151-15 -C. 627 0.935 -6.792		151.15 -0.037 0.0 0.925 -1.046		151.15 -6.037 0.0 0.925 -1.093		151.15 -0.037 0.925 -1.030
	151.70 -C.028 0.03 -0.839		151.07 -0.029 3.0 0.936 -0.867		151.63 -0.13C 0.0 0.935 -0.689		151.63 -0.630 0.0 0.935 -0.009		151.63 -6.040 0.0 0.925 -1.195		151.63 -C.04C 3.0 0.925 -1.195		151.63 -0.040 0.925 -1.195
	152.43		152.43 -0.034 0.0 0.036 -1.000		152.23 -C.034 0.0 0.9 0.935 -1.011		152.23		152.23 -0.044 0.925 -1.317		152.23 -0.044 0.0 0.925 -1.317		152.23
	154.31 -0.346 3.937 -1.368		154.07 -0.045 0.0 0.936 -1.354		153.37 -0.045 0.0 0.935 -1.342		153.47 -0.045 0.035 -1.342		153.87 -0.055 0.0 0.925 -1.648		153.87 -0.055 0.0 0.925 -1.648		153.67 -C.355 C.3 0.925 -1.038
	155.40 -0.053 0.0 0.437 -1.549		155.07 -0.052 0.0 0.936 -1.557		154.80 0.051 0.0 0.435		154.00 -0.051 0.6 0.935		154.40 -0.062 0.0 C.925 -1.837		154.80 -0.662 0.0 0.925 -1.837		154.80 -0.062 0.0 0.925 -1.837
	155.53 -0.054 6.3 0.917 -1.609		155.16 -0.053 0.0 0.936 -1.576		154.49 -6.052 0.0 0.935 -1.549		154.89 -3.052 6.0 0.935 -1.549		154.89 -0.362 0.0 C.925 -1.855		154.89 -0.062 0.0 0.925 -1.855		154.89 -0.002 0.925 -1.855
4 PASS	155.67 -0.055 0.0 0.917 -1.644	4 PASS	155.12 -0.054 0.0 0.916	4 PASS	155.04 -0.053 0.0 0.935 -1.579	4 PASS	155.04 -0.053 6.0 0.435 -1.579	S PASS	155.04 -0.063 0.0 0.925 -1.885	S PASS	155.04 -0.063 0.0 0.425 -1.385	5 PASS	155.64 -0.063 0.0 -0.925 -1.665
EFFECT	155.74 -0.056 6.6 0.437 -1.658	EF P &C'1	155.38 -0.054 0.0 0.936 -1.620	EPFECT	155.09 -0.053 0.0 0.935 -1.591	10344	155.09 -0.053 0.0 0.935 -1.591	EPPECE	155.09 -0.064 0.0 0.0 0.925	LFFECT	155.14 155.09 -0.064 -0.664 0.0 0.0 0.925 0.925 -1.907 -1.897	EFFECT	155.09 -0.064 0.0 0.0 0.925 -1.847
MULTI-PASS	155.33	TI-FASS	155.14 -0.055 0.0 (.936 -1.631	RULTI-PASS	-0.054 0.0 0.9 0.935	INVOLUE RULTI-PASS PFFECT	155.14 -0.054 0.935 -1.601	TI-PASS	155.14 -0.064 0.0 0.925 -1.907	INVOLVE RULTI-PASS EFFECT	155.14 -0.064 0.0 0.925 -1.907	INVCLVE RULTI-PASS EFFECT	155.14 -0.064 0.925 -1.907
	155.86 -0.057 0.0 0.937 -1.683	INVOLVE BULTI-FASS	155.50 -0.055 0.0 0.916		155.20 -0.054 0.0 2.935 -1.412	TOW SAT	155.26 -0.054 0.0 0.915 -1.612	INVOLVE MULTI-PASS	155.20 -0.064 0.0 0.925 -1.918	LVE RUL	155.20 -0.064 0.0 0.925 -1.918	TAS EAT	155.20 -0.364 0.925 -1.918
INVOLVE	150.03 -0.017 -4.697 0.937 139.313	OANT	150.62 -3.018 -4.697 6.936 139.280	INVOLVE	153.31 -0.619 -4.697 6.645 139.252	INVO	150.01 -0.019 -4.697 0.935 139.252	OANT	150.01 -0.029 -4.697 C.925 138.946	DANI	150.01 -0.029 -4.697 0.925 133.946	TRAC	150.01 -0.029 -4.697 0.925 133.946
TIRE= 900.00	TENDERSTORE RECH. STRAIN PLASFIC STRAIN TOTAL STRAIN STRESS	TIME= 950.00	TEAPEHATURE MECH. SIHAIN PLASTIC SIRALN TOTAL SIRAIN STRESS	TIME: 1000.00	EERPERATURE RECH. SIRAIN PLASEIC STRAIN TOTAL STRAIN	TIRE= 1000.00	TEMPEPATURE MUCH. SCHAIN PLASIC SCHAIN TOIAL SCHAIR STHESS	TIME= 0.3	TERPERATURE MECH. SERAIN PLASIEC SERAIN TOTAL SERAIM STRESS	TIRE= 1.00	TEMPERATURE MECH. SIMAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIRE= 2.00	TERREPORTORS FECH. SINALS PLASTIC STALE TOTAL SINALS STRESS
jud Eur	STORES	-	SHERE	3-4 (-4	M M M O F	end End	S S S S S S S S S S S S S S S S S S S	\$100 \$100	TERE PLA: TOT	(-d	12 12 10 10 10 10	(ma) (ma)	7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7



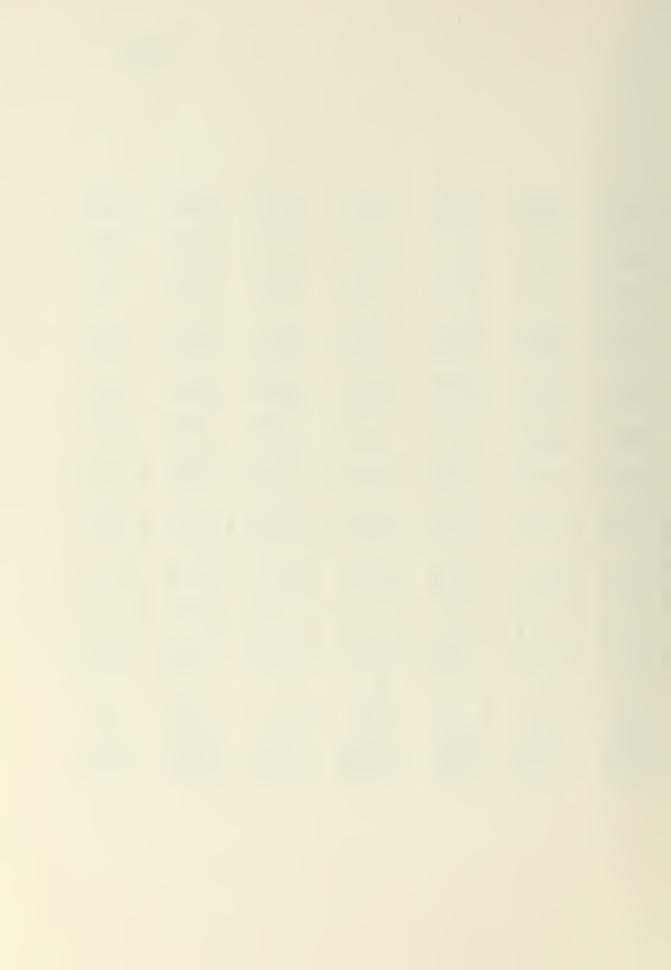
	151.15 -0.037 0.0 0.925 -1.094		151.15 -0.037 0.925 -1.094		151.15 -0.037 0.0 0.925 -1.094		151.15 - 0.037 0.0 0.925 -1.698		151.15 -0.037 0.0 C.925 -1.098		151.15 -0.036 0.925 -1.675		151, 15 -0.014 0.0 0.446
	151.63 -0.040 0.0 0.925 -1.195		151.63 -0.040 0.0 0.02 -1.195		151-43 -3.740 0.0 0.425 -1.195		151.63 -0.040 0.00 0.025 -1.195		-0.00 0.00 0.00 10.90 1.94		151.63 -0.039 0.0 0.425 -1.172		151.03
	152.23 -0.044 0.0 0.925 -1.317		152.23 -f.c44 0.0 0.925 -1.317		152.23		152.23 -0.04% C.3 0.925		152.23 -0.644 0.0 0.925 -1.316		152.23 -6.643 0.925 -1.294		152.23 -0.026 0.943 -0.782
	153.87 -0.055 0.925 -1.648		153.87 -0.055 0.0 0.925 -1.648		153.87 -0.05 0.0 0.925 -1.648		153.47 -0.055 0.0 0.925 -1.649		153.87 -0.055 0.0 0.925 -1.648		153.07 -0.055 0.0 0.925 -1.625		153.87 -0.037 0.0 0.943 -1.114
	154.80 -0.062 C.0 0.925 -1.837		154.80 -0.002 0.0 0.925 -1.837		154.00 -0.062 0.0 0.925 -1.037		154.80 -0.062 6.0 0.925 -1.837		154.80 -0.002 0.925 -1.837		154.80 -0.061 0.0 0.925 -1.814		154.86 -0.044 6.0 6.943 -1.303
	154.89 -0.062 0.0 0.925 -1.855		154.85 0.0 0.0 0.925 -1.855		154.89 -0.052 (.0 0.925 -1.855		154.05 -4.062 0.0 0.925 -1.855		154.89 -0.062 0.0 0.925 -1.855		154.89 -0.062 C.0 0.925 -1.832		154.89
S PAGS	155.24 -0.063 0.0 0.925 -1.685	5 PASS	355.04 -0.00 0.00 0.00 0.00 0.00 0.00 0.00	5 PASS	155.04 -0.063 0.00 0.425 -1.883	5 PASS	155.04 -0.063 0.0 0.925 -1.865	5 PASS	155.04 -0.043 0.425 -1.885	5 PASS	155.04 -0.063 0.0 0.925 -1.862	5 PASS	155.04
EFFECT	155.C9 -0.064 0.0 0.525 -1.897	EPPECT	155.39 -0.064 0.0 C.925 -1.897	EFFECT	155.09 -0.064 6.0 0.925	EPFICT	155.09 -0.064 0.0 0.925 -1.897	EFFECT	155.10 -0.064 0.0 0.925 -1.897	EFFECT	155.10 -0.063 0.0 0.925 -1.075	EFFECT	155.11 -0.040 0.0 6.943 -1.366
MULTI-PASS	155.14 -0.06% 0.0 0.525 -1.907	TI-PASS	155.14 -0.064 0.0 0.925 -1.937	INVOLVE HULTI-PASS	155-14 -0.054 0.0 .0.425 -1.407	TI-PASS	155.14 -0.064 0.0 6.925 -1.937	TI-PASS	155.15 -0.064 0.0 0.925 -1.937	TI-PASS	155.16 -0.063 0.00 0.925 -1.888	TI-PASS	155.26 -0.047 0.0 1.943 -1.396
TOW KATOA	155.20 -0.064 0.0 0.925 -1.918	INVOLVE RULTI-PASS	155.20 -0.064 0.0 3.925	TAE HAT	155.20 -0.064 6.0 0.925 -1.910	INVOLVE AULTI-PASS	155.20 -0.064 0.0 0.925 -1.918	INVOLVE RULTI-PASS	155.22 -0.065 0.0 0.925 -1.922	INVOLVE RULTI-PASS	155.46 -0.065 0.0 0.925 -1.548	INVOLVE AULTI-PASS	154.37 -0.066 0.6 0.6 0.943
DANT	150.01 -0.029 -4.697 (.925 138.946	INVO	150.01 -0.029 -4.697 .0.925 138.946	INVO	150.01 -0.029 -4.697 0.325 138.246	1440	15C.03 -0.027 -4.697 0.925 13M.942	INVC	150.40 -0.032 -4.697 0.925 134.462	DANI	161.62 -0.108 -4.697 0.925 130.441	DANT	367.96 -1.555 -4.697 6.743 91.028
3.00	STEPPE SETTIN SERVIN	6.00	2	5.30	SERALS SERALS SERALN	6.03	ATUFE SERALM STRALM STRALM	7.00	TEMPERATURE RECH. STRAIN PLASTIC SERAIN TOTAL STRAIN STRESS	00.0	TEMPERATURE MECH. SFRAIN PLASIIC STRAIM TOTAL STRAIM STRESS	00.6	TEMPTRATURE MUCH: SINALH PLASING STRALM TORAL SIRALM STRISS
TIMEs	TEMPERATURE BECH. SIRAI PLASTIC STR TOTAL SIRAI STRESS	10 10 10 10 10 10 10 10 10 10 10 10 10 1	TECHERATURE KECH. STHAIS PLASTIC STR TOTAL SIRALI STRESS	13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	TEMPERALUZE MECH. SERAI PLASILC STA TOTAL STRAI STRESS	1138-	TERPENATURE MECL. SERAL PLASTIC STR TOTAL STRAL STRESS	TIRLE	TEMPERATICH: SI PLASTIC TOTAL SI STRESS	11 37 144 640	TEMPER MECH. PLASEL TOTAL STRESS	TIRE	TEMPTS MICH PLASE TOTAL STAILSS



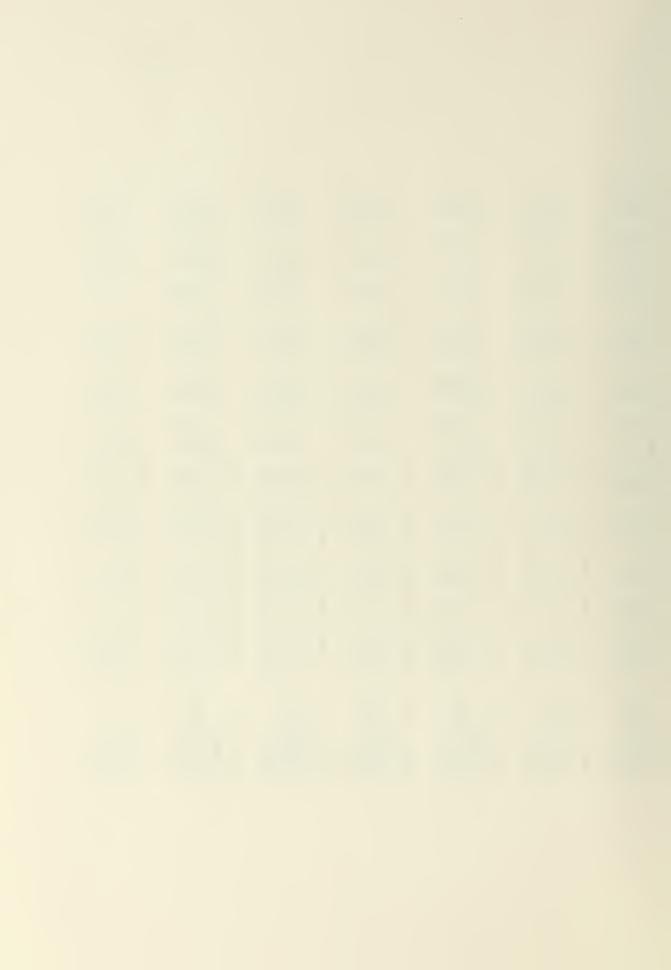
151.15 0.0 0.0 1.055 2.786				151.15		151.15 0.135 0.0 1.697 4.022		151.15 0.062 0.0 1.023 1.636		151.15 0.069 0.0 1.031 2.056		151.15 0.074 0.0 1.035 2.195
		_				151.63		MJ.		151. 63 0.00 0.0 1.031 1.959		25.030 0.070 0.05 0.05 2.03 2.03 2.03 2.03 2.03 2.03 2.03 2.03
_		-		-		152.23 C.12d 0.0 1.097 3.403		152.23 0.054 0.0 1.023		152.23 0.302 0.9 1.031 1.837		152.23
153.87 0.075 J.J 1.055 2.235		153.47 0.085 0.0 1.066 2.543		153.87 0.021 0.0 1.002 0.638		153.87 0.0 1.097 3.471		153.37 0.043 0.0 1.323 1.285		153.87 0.051 0.0 1.031		153.87 0.055 0.05 1.935
154.40 C.069 0.0 1.055 Z.046		154.83 0.079 0.0 1.066 2.353		154.H3 0.315 0.0 1.002 0.448		154.83 0.11C 0.0 1.997 3.260		154.81 0.037 0.0 1.023 1.024		154.81 0.04 0.0 1.031		154.83 0.049 0.0 1.055 1.443
154.89 0.0 0.0 1.055 2.028		154.49 0.079 0.0 1.006 2.335		154.89 0.014 1.002 0.433		154.43 6.110 0.0 1.097 3.201		154.92 0.036 0.0 1.023		154.95 3.343 C.0 1.031		155.22 0.047 0.0 1.035 1.410
155.05 0.047 0.0 1.055 1.995	S PASS	155.08 0.077 6.0 1.066 2.296	5 PASS	155.18 0.012 0.0 1.002 0.372	5 PASS		's PASS	156.26 0.027 0.0 1.023 0.798	5 PASS	157.31 0.027 0.0 1.031 0.806	S PASS	150.021
155.18 0.066 0.0 1.655	EPPECT	155.3% 0.075 0.0 1.0%6 2.233	RFFECT	156.41 0.004 0.0 1.662 3.122	EFFECT	154.03 0.008 0.0 1.097 2.643	EFFECT	160.69	EPFECT	164:44.7 -0.322 0.0 1.031	EFFCT	169.16 -0.050 -0.0 1.625 -1.475
156.00 0.061 0.0 1.055 1.402	TI-PASS	157.94 0.058 6.0 1.366	TI-I'ASS	162.15 -0.035 0.0 1.062 -1.047	TI-PASS	169.16 0.0 0.0 1.097 0.349	TI-PASS		TI-PASS	189.76 -0.197 6.0 1.031		201.44
170.41 -C.038 0.0 1.055	LVE RUL	200.19 -3.236 0.6 1.066 -6.979	LVE MUL	242. 43 -3.601 0.0 1.002 -17.737	TAE MUL	-6.804 0.0 1.097 -23.553		115.62 -1.118 0.6 1.023 -32.598		338.97 -1.285 0.0 1.031 -37.366		355.14 -1.403 3.0 1.035 -43.682
2500.33 -17.570 -17.573 1.055 3.3	INVO	2500.00 -17.559 -17.559 -1.366	INVO	2342.82 -16.237 -17.559 1.562 0.820	CVMI	2503.03 -17.52U -17.52b 1.047 6.3	THAO	1529.28 -10.638 -13.143 1.024 13.503	INVO	1423.60 -10.341 -13.180 1.031 20.769	INVO	1334.27 -9.903 -13.151 1.035 31.200
28	11.33		12.30	E R R R R R R R R R R R R R R R R R R R	13.00	2	14.00	TURE	15.00		16.33	SIRAIN C SIRAIN SIRAIN
TERPERA BECH S PLASTIC TOTAL S STREES	TIBE	TEMPERA BLASTIC TOTAL S STRESS	81 87 94 64	TEMPERA BECH: S' PLASTIC TOTAL S	E4 85 85 85 85 85 85 85 85 85 85 85 85 85	TERFERA EECH. S PLASTIC TOIAL S STRESS	TIME	TEXTERS RECH. S TOTAL S TOTAL S TOTAL S	TIME	TEMPERA HECH: S PLASTIC TOTAL S STRESS	TIME	TEMPLER JULE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STREES
	ATURE 2500.30 170.41 156.00 155.18 155.35 154.89 154.80 153.87 152.23 151.63 15 STRAIN -17.570 -0.03 0.061 0.066 0.007 0.06 0.075 0.086 0.016 C STRAIN -17.570 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 STRAIN 1.055	SERAIN -17.570 -C.034 0.061 0.066 0.007 0.004 0.075 0.086 0.010 0.06 0.007 0.004 0.075 0.086 0.010 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	SCHAIN -17.570 -C.038 0.066 0.007 0.00 0.00 0.00 0.00 0.007 0.005 0.007 0.006 0.007 0.00 0.00 0.00 0.00 0	SCHAIN -17.570 -C.034 0.061 0.066 0.007 0.006 0.075 0.096 0.075 0.096 0.075 0.096 0.075 0.096 0.075 0.096 0.075 0.096 0.075 0.096 0.075 0.096 0.096 0.075 0.096 0.096 0.096 0.097 0.096 0.096 0.096 0.097 0.096 0.097 0.096 0.097 0.096 0.097 0.096 0.097 0.	STRAIN -17.570 -0.00 0.06 0.066 0.007 0.00 0.0075 0.006 0.0075 0.006 0.0075 0.0	STRAIN -17.570 -C.038 0.061 0.C66 0.C67 C.069 0.C75 C.086 C.006 0.C75 C.006 0.	NATURE 2500.JJ 170.41 150.00 155.18 155.35 154.89 154.40 153.87 152.23 151.63 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	STRAIN 1.550 1.055 1.0	THE SCOULD TOWN TOWN TOWN TOWN TOWN TOWN TOWN TOWN	STRAIN 11530 170.41 150.00 155.18 155.35 154.89 154.80 155.07 152.23 151.63 15.57 1.055 1.	THATE	2500.00 170.41 156.03 155.18 155.35 154.89 154.90 153.87 152.23 1516.3 -17.770 - C.038 0.0461 0.066 0.007 0.008 0.077 0.008 0.075 0.008 0.007 0.008 0.007 0.008 0.007 0.008 0.007 0.008 0.007 0.008 0.007 0.008 0.007 0.008 0.008 0.007 0.008 0.008 0.007 0.008 0.008 0.007 0.008 0.008 0.007 0.008 0.008 0.007 0.008 0.008 0.007 0.008 0



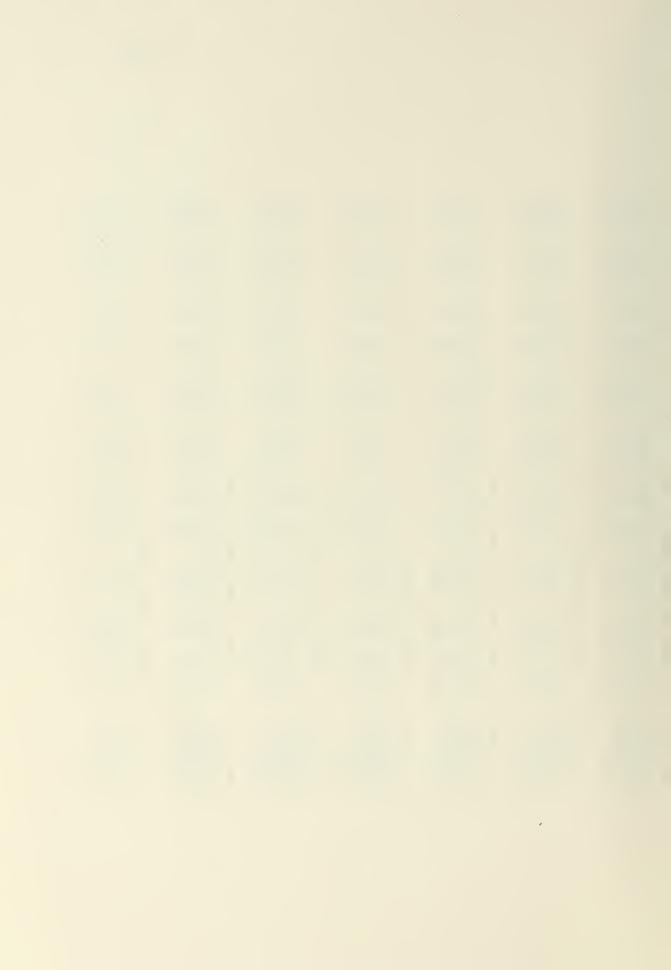
151.15 6.077 9.039 1.039 2.292	151.15 0.078 0.0 1.040	151.15 0.0 0.0 1.040 2.329	251,15 0.079 0.0 1.041 2.352	151.15 0.00 0.00 1.052 2.701	151.15 0.097 0.0 1.059 2.693	151.15 0.0 0.0 1.00 2.942
151.63 0.674 0.3 1.019	151.63 C.075 G.C 1.040 2.236	151.63 0.075 1.040 2.132	151.01	151.63 C.038 C.C 1.652 2.604	151.63 0.094 0.0 1.059 2.796	151.03 5.0 0.0 1.00 1.00 2.40 2.40
152.23 0.070 1.039 2.073	152.23	152.23	152.23 0.072 0.0 1.041 2.133	152.23 0.0083 1.052 2.462	152.23 0.094 0.0 1.059 2.674	152.23 6.091 0.0 1.060 2.723
153.87 0.059 0.059 1.039	153.87 0.060 9.0 1.040	153.87 0.060 0.060 1.040 1.778	153.87 0.061 0.0 1.041	153.47 0.072 0.0 1.352 2.156	155.88 0.073 1.059 2.339	15 5. 97 0.00 0.0 1.000 2.373
154.85 0.052 0.052 1.039	154.90 0.053 0.0 1.040	154.97 0.052 0.0 1.040 1.555	155.07 0.052 0.0 1.041	160.33 0.024 0.0 1.052 0.840	169.90 -0.031 0.0 1.059 -0.931	174.35 -0.095 0.0 1.000 -2.822
155.13 0.050 0.0 1.039 1.445	155.30 0.05 0.05 1.340	155_84 6.046 1.040 1.367	1.291	167.14 -0.014 0.0 1.052 -0.556	181.49 -0.112 0.0 1.059 -3.311	142.73 -0.183 0.0 1.063
5 PASS 160.82 0.011 1.039 0.326	5 PASS 163.27 -0.004 0.0 1.340	5 PASS 166.12 -0.024 1.640 -0.719	164.16 10.00 10.00 10.00 10.00 10.00	202.62 -0.268 0.0 1.052 -7.916	5 PASS 223.15 -0.405 0.0 1.059 -11.469	5 PASS 232.11 -0.468 0.J 1.065 -11.300
174.63 -0.644 0.0 1.039	18C.57 -0.124 0.0 1.049	186.72 -0.167 0.0 1.640 -4.952	192.81 -0.209 1.641 -6.202	237.31 -0.514 6.6 1.052 -15.132	253.43 -0.624 0.0 1.059	20 7
RULTI-FASS 00 212.91 182 -0.353 0.0 0.0 0.39 1.039	LNVCLVE BULTI-PASS 5U 373.6b 223.b5 74b -1.53w -0.428 35c 6.6 6.0 03U 1.040 1.040	11-FASS 233.40 -0.498 1.040 -14.678	10/4,05 179.79 241,91 1-1,529 -1,585 -0,558 -1,349 -1,585 -0,558 1,041 1,041 1,041 1,041 1,041	1-FASS 6J.24 -J.348 C.0 1.052 24.950	287.79 -0.475 0.0 1.059	71-PASS 282.09 -C.836 1.660 -24.45
366. 0	373.06 -1.53# 0.00 1.040	377.40 -1.56 0.0 1.04 -45.30	379.79 -1.58 0.0 1.04 1.04	365.11 -1.46 0.0	# 1.267 # -1.267 9 0.0 9 1.059 7 -36.837	319. 20 319. 20 0.0 1.000 1.000 -32.293
IM VO 1256.76 - 9.375 - 12.425 1.639	1164.58 -8.746 -12.356 1.030 53.869	1112.25 377.40 -0.050 -1.567 -11.782 0.0 11.440 1.040 6H.401 -45.3040	1054.05 -7.529 -11.335 1.641 78.241	144.92 365.11 2-4.56b -1.461 1.052 1.052 1.052 1.052 1.052 1.12.16.16.16.16.16.16.16.16.16.16.16.16.16.	1880 603.94 -3.554 -7.755 1.059	516. 75 -2.643 -7.005 1.005
TIME= 17.00 TEMPERATURE FECH. STRAIN FOTAL STRAIN STPESS	TIMES 10.00 TERFER 10.00 RECH. STRAIN PLASIC STRAIN STRESS	TIME= 14.00 TEMPERATURE PERSILC STRAIN TOTAL STRAIN STARSS	TIMES 20.00 TEMPERATURE PLASTIC STRAIM TOTAL STRAIN STRESS	TIME= 30.00 TIMPERATURE MICH. STRAIN PLASTIC STRAIN JOYAL SIRAIN SIRESS	TIME #C.00 TENDERTURE RECH. SIRALN PLASTIC STRALN TOTAL STRALN STRESS	TIMES SO.33 TEMPORATURE WECH STRAIN PLASING STRAIN TOTAL STRAIN STRESS



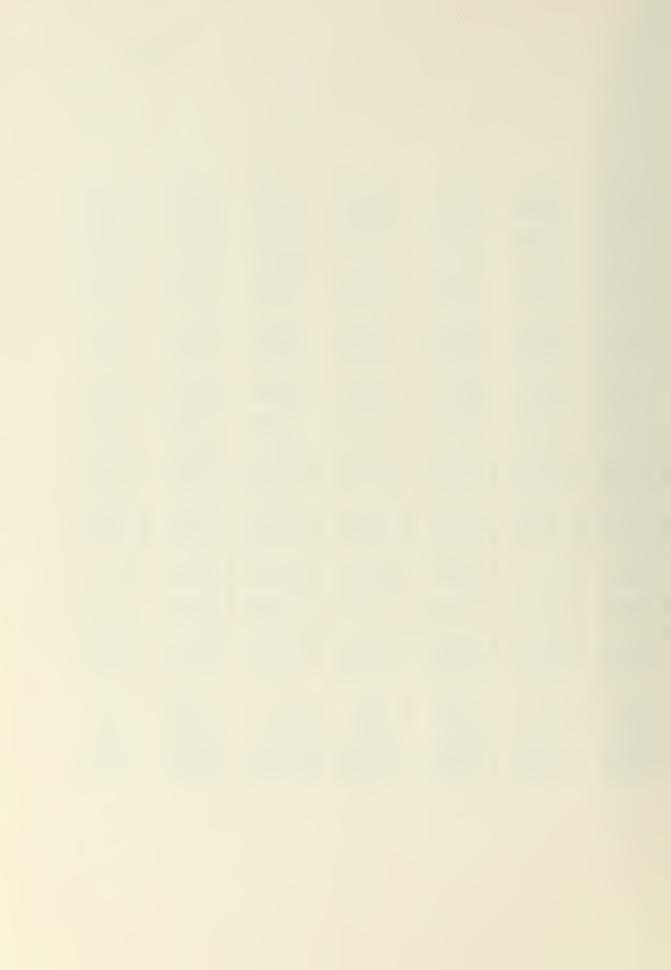
151-15 0-038 0-038 1-060 1-050	151.15 0.097 0.0 1.058 2.876	151.15 0.094 0.0 1.055 2.793	151.15 0.651 0.0 1.052 2.696	151.15 0.0087 0.00 1.049 2.591	151.15 0.06 0.0 1.03 1.030	151, 15 0, 0 0, 0 1, 0, 13
151.63 0.095 0.0 1.060 2.036	151.63 0.093 0.0 1.058 2.779	151.63 0.051 0.05 1.055 2.696	151.63 0.607 0.0 1.052 2.599	151.63 0.03¢ 0.03¢ 1.0¢ 2.¢y¢	151.43 0.065 0.0 1.030	153.04 0.00 1.00 1.413
152.23	152.23 0.389 0.0 1.358 2.657	152.23 0.046 0.0 1.055 2.574	152.24 0.0 1.052 2.476	152.24 0.083 0.0 1,049 2.371	152.15 0.0 0.0 1.030 1.800	152.69 C.041 U.J. 1.Cls
154.22 0.077 0.0 1.060 2.304	155.02 0.073 C.0 1.058 2.091	155.87 0.062 0.0 1.055	156.8H 0.652 0.0 1.052 1.533	157.96 0.041 0.0 1.049	162.65 -0.010 0.0 1.030 -0.297	164.89 -C.042 0.0 1.513 -1.259
186.69	191.60 -0.184 0.0 1.058	145.69 -0.210 6.222	197.02 -6.227 0.0 1.052 -6.718	197.95 -0.237 0.0 1.049 -7.015	195.22 -0.236 0.0 1.030 -6.994	188.82 -6.208 0.0 1.513 -6.174
200.08 -0.241 -0.241 -7.123	204.41 -0.273 0.0 1.050 -8.075	206.65 -0.291 0.0 1.055 -8.622	207.44 -C.JC1 0.0 1.052 -B.dd8	207.34 -0.303 C.0 1.04%	200.73 -0.275 0.0 1.030 -8.137	192.23 -0.232 0.0 1.013 -6.873
235.06 -0.490 0.0 1.060	2 34 . 85 -0.4 40 1.05 0 -14.462	5 PASS 233.01 -0.479 0.0 1.055 -14.137	2 230. J3 -0.464 -0.00 1.352	227.28 -0.445 0.0 1.349	5 PASS -0.351 -0.351 -10.30 -10.30	5 PASS 174.50 -0.277 0.0 1.013
275.0d 255.11 2 0 -0.781 -0.635 0 1.060 0 1.060 1.060 2 -22.093 -18.062	251.27 -0.009 C.C 1.058	246.62 -0.578 0.0 1.055	9 70	236.93 -0.514 6.6 1.049	216.24 -0.365 0.0 1.030	201.30 -0.296 0.0 1.013
MULTI-FASS 00 275.0d 980 -0.781 0 0.0 000 1.060 633 -22.093	267.09 -0.724 0.3 1.05b	259.43 -0.671 0.0	11-6455 -652- -0.0 1.052		220.47 -0.415 0.0 1.030	203.67 -0.51 -0.51 1.013 -4.253
332.09 332.09 0.0 1.06 -28.63	247.8L -0.87u 0.3 1.058	275.63 -0.791 0.0 1.055	265.61 -0.719 0.0 1.052 -21.112	256.75 -0.658 1.049	225.53 225.53 -0.45 1.05 -13.33	2.06.46 -0.33.2 0.0 1.013
1885.18 -2.152 -6.641 1.060	408.52 -1.786 -6.344 1.356	371.67 -1.508 -6.083 -6.055	341.62 -1.284 -5.470 1.052	117.51 -1.106 -5.703 1.049	238.04 -0.541 -5.179 1.010	199,30 -0.282 -4.945 1.013
SERAIN	TIME: 70.30 TEMPERATUAL RECH. SIMAIN PLASTIC SERAIN STRENS	TIME BO.JU TERPERATURE RECH. SIRRIM PLASFIC SIRRIM TOTAL SIRRIM SIRESS	TIME 90.30 TERPERATURE MECH. STRAIN PLASIEC STRAIN TOTAL STRAIN STRESS	TIRE= 10C.00 TEMPERATURE SECH. STHAIN PLASIC STRAIN STRAIN STRAS	TIME= 150.30 TEMPERATHE MECH. SIRAIN PLASTIC STRAIN TOTAL SIRAIN STRESS	TIRE= 200.00 IEMPERATURE MECH. STRAIN PLANAC SIPAIN ICTAL SIRAIA STRAIA
TIME# 60.00 TEMPEGATURE HECH: STRAIN TOLAL SIRAIN STRESS	TIME: 70.00 TENPERATURE MECH: STRAIN PLASTIC STRAIN TOTAL STRAIN	TINES HO.J. TERPERATUSE RECH. SFRAIM PLASIIC STRA TOTAL SIRRIN	TIME 90.0 TERPEMATURE HECH: STRAIN PLASKIC STRA TOTAL STRAIM	TEMPERATURE JECHOSTHAIN PLASIC STRAIN TOTAL STRAIN STRESS	TENDERATHE AECH. SFRAIN PLASTIC STRA TOTAL SIRAIN STRESS	TINE= 200.0 ISWERATURE NECH. STRAIN TOTAL STRAIN STARES



151.16 3.037 6.0 0.699	151.16 0.025 0.0 0.586 0.738	151.18 C.014 3.0 0.976 3.417	151.22 0.005 0.0 0.907 0.159	151.26 -0.002 0.0 0.460 -0.057	151.30 - v. 0 0 8 2. 0 0 . 4 5 4 - 0 . 2 4 4	51.15 -0.0 0.0 0.049
151.64 0.034 0.939 1.003	151.75 0.021 0.0 0.5 0.546	151.85 0.0 0.976 0.283	151.94 0.00 0.00 70.00 10.00	552.04 -0.007 0.900 -0.215	152.11 -0.014 0.0 0.54 -0.408	52.017 -0.019 0.00 0.019 0.019
153.34	153.79 0.00 0.0 0.486	154.28 -0.006 0.0	154.22 -0.015 0.907 -0.451	154.24 -0.022 0.960 -9.663	154.17 -0.028 0.0 0.954 -0.827	54.05 -0.032 0.0 0.0 0.0
165.23 -0.059 0.999	164.57 -0.067 0.0 0.0986	163.47 -0.070 0.0 0.347e -2.042	162.26 -0.010 0.967 -2.045	161.07 -0.069 0.0 0.960 -2.059	159.48 -0.067 0.0 0.454 -2.006	159.01 -6.006 0.0 0.949 -1.956
182.59 -0.179 0.993 -5.315	177.26 -0.155 0.0 0.986	172.90 -6.115 0.0 0.976 -4.304	169.37 -0.119 0.0 0.467 -3.558	166.55 -0.107 0.6 0.960 -3.168	164.28 -0.097 0.0 0.954 -2.883	162.47 -6.549 0.0 0.949 -2.660
104.82 -0.195 6.0 0.999	178.77 -0.165 0.0 0.986	173.95 -0.142 0.0 0.976 -4.224	170.14 -0.124 0.6 0.967 -3.694	167.12 -0.111 0.0 0.960 -3.245	164.72 -0.103 0.6 6.954 -2.972	162.81 -C.092 0.0 0.949 -2.730
188.45 -0.223 0.00 0.999	5 PASS -0.164 0.0 0.096	5 PASS 175.81 -0.155 0.0 0.976 -4.605	5 PASS 171.46 -0.134 6.0 0.967 -3.968	5 PASS 166.11 -0.117 0.0 0.960	5 PASS 165.48 -0.105 0.0 0.0 0.954 -J.127	163.40 -0.04 0.0 0.04 0.04 0.04 0.04 0.04 0
196.57 -0.235 0.999	182.56 -0.191 0.0	176.58 -0.161 0.0 0.976	172.03 -0.137 0.0 0.907 -4.082	16 8.52 -0.120 0.0 0.960 -3.570	165.79 -0.137 0.0 6.954 -3.153	163.64 -5.69 0.0 0.949 -2.903
AULTI-PASS 2 192.03 (57 -0.245 0.09 199 0.999	183.51 -0.198 0.0 0.906 -5.873	177.24 -0.165 0.0 0.476 -4.899	172.49 -0.141 0.50 0.167	11-PASS 168.86 -0.123 0.0 0.960 -3.640	166.64 -0.109 0.0 6.954 -3.242	163.64 -0.099 0.0 0.949
ENVOLVE NUL 53 193.72 151 -0.257 623 6.0 999 0.999	184.60 -0.20 0.3 0.986 -6.097	INVOLVE RULTI-PASS 11 177.98 177.24 647 -0.176 -0.155 737 0.0 0.0 7.76 0.976 0.976 452 -5.051 -4.899	LHVOLVE NULTI-PASS 13 173.02 172.49 028 -0.144 -0.141 721 C.0 0.30 567 0.967 0.967	INVOLVE MULTI-PASS 75 169.24 168.86 019 -0.125 -0.123 714 0.6 0.0 920 0.960 0.960	166.33 -5.111 0.0 0.954 -3.301	INVOLVE hULTI-PASS 43 104.07 164.04 514 -0.100 -0.059 711 0.0 0.949 774 -2.996 -2.941
ENWC 178.53 -0.151 0.999 138.776	1840 -0.083 -6.768 -4.768	160.11 -0.647 -4.737 0.:76	194.01 -4.721 -4.721 -4.721	153.75 -0.019 -4.714 0.260	152.11 -0.015 -4.711 6.954 119.741	151.43 -0.014 -4.711 0.949 135.774
TIME 250.00 TEMPERATURE HECH STATEM PLASTIC STATEM TOTAL STRATEM STRESS	TIMES JOC. 30 TEMPERATURE BECH. STRALE PLASTIC STRALE FOTAL STRALE	TEME JSO.00 TEMPERATURE HPCH. STRAIN PLASTIC STRAIN LUTAL STRAIN	TIME 46C.00 LEBE STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIRE 450.06 TERPERATHE RECH. SIRALN PLASIIC SIRALN IOTAL SIRALN STRESS	TIME 500.00 TEMPERATURE MECH. SIMMIN PLASTIC SIMAIN TOTAL SIMAIN	TIME= 550.00 TEMPLYNINE MECH. STRAIN PLASTIC STRAIN STRESS



151.39 -7.618 0.0 0.945 -6.533	151.42 -0.022 0.942 -0.643	151.45 -t.c24 0.0 7.93y	151.46 -0.027 0.03 0.937 -0.794	151.47 -3.023 C.0 0.735 -0.856	151.47 -0.030 0.0 0.933 -0.906	151.47 -6.532 0.0 0.932 -0.943
152, 19 -0.023 0.0 0.945 -0.694	152.1d -0.027 0.94 -0.796	152.16 -0.329 0.3 0.939 -0.864	152.14 -0.031 0.037 -0.937	152.19 -0.033 0.0 0.535 -0.983	152.06 -0.034 0.0 0.933 -1.026	152.11
153.90 -0.035 0.045 -1.043	153.73 -0.037 0.942 -1.110	153.56 -0.039 0.00 0.939	200000000000000000000000000000000000000	153.25 -0.041 0.935 -1.216	153.12 -0.342 0.0 0.933 -1.239	152.29 0.342 0.932 -1.253
158.18 -0.064 0.0 0.945 -1.510	157.46 -0.063 0.942 -1.868	156.86 -0.061 0.0 0.439	156.15 -0.069 0.937 -1.785	155.93 -0.059 0.0 0.935 -	155.57 -6.058 0.0 0.931 -1.738	155.28 0.058 0.5 0.5 12
161.01 -0.084 0.0 0.945 -2.447	159.84 -0.079 0.0 0.942 -2.351	158.83 -0.075 0.0 C.939 -2.22y	158.13 -0.072 0.0 0.937 -2.146	157.51 -0.070 0.00 0.915 -2.080	157.01 -0.668 0.0 0.933 -2.029	156.60 -0.007 0.07 0.432 -1.945
161.29 -0.056 (.0 0.945 -2.543	166.36 -0.36 0.34 -2.347	159.38 -0.070 3.3 0.939 -2.263	154.29 -0.373 0.91 -2.180	157.66 -0.071 0.0 0.515 -2.110	157, 14 -0.069 0.0 0.933 -2.056	156.72 -0.064 (.0 0.452 -2.010
161.76 -0.384 0.6 0.945 -2.643	5 PASS 160.46 -0.083 0.942 -2.477	159.42 -6.079 0.0 0.419 -2.316	154.54 -0.375 0.437 -2.238	5 PASS 157.91 -0.073 0.935 -2.162	5 PASS 157.37 -0.071 0.0 0.433 -2.102	5 PASS 156.93 -0.363 -2.052
161.95 - C.090 - C.0 0.945 -2.679	160.61 -0.084 0.0942 -2.509	159.55 -0.079 0.0 0.939	158-69 -0.076 0.937 -2.261	158.01 -0.073 -0.073 -2.182	157.46 -0.071 0.0 6.933	EFFECT 157.02 - C.070 C.0 0.922 -2.669
NULTI-PASS 19 162.11 192 -0.091 6.0 145 0.945	INVOLVE HULTI-PASS 56 160.89 160.74 016 -0.086 -0.085 711 0.0 0.9 542 0.942 736 -2.556	159.66 -0.080 0.0 0.939 -2.185	LNVOLVE RULTI-FASS EFFECT 45 154.90 154.79 158.69 724 -0.477 -0.377 -0.07 711 0.0 0.93 0.937 0.93 618 -2.302 -2.281 -2.26	154.10 -0.074 0.0 0.935	20 157.62 157.54 022 -0.072 -0.072 711 0.0 0.0 933 C.933 0.933 561 -2.153 -2.136	14 157.16 157.09 157.09 023 -0.07 0.07 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
162.2 -0.0 0.0	160.89 -0.086 0.042 -2.566	36 159.7e 159.66 36 159.7e 159.66 017 -0.081 -0.080 711 0.0 0.39 934 0.939 0.939 714 -2.810 -2.385	158.96 -0.077 6.09 1.937	10 158-19 154-10 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	157.62 157.62 1 0.072 0.0 0.0	157. 16 -0.071 0.0 0.932 -2.099
15C.09 -0.015 -4.711 0.945	150.56 -0.016 -4.711 6.542	150.36 -0.017 -4.711 C.934	150.45 -0.020 -4.711 0.937	150.39 -0.021 -4.711 -4.711 0.935	150.20 -6.022 -4.711 6.933	150.14 -0.02.1 -4.72.1 0.43.1
THE COLUMN TO THE COLUMN THE COLU	650.30 TURE STRAIM STRAIM	TIME= 700.00 IEMPERATURE MECH. STRAIN PLASTIC STRAIN STREE STRAIN	TERPERATURE TERPERATURE ALCH: STRAIN PLASTIC STRAIN STRESS	TIME= 400.00 TEMPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN	TIME USD.JJ TEMPERATURE MECH.STRAIM PLASIIC STRAIN TOTAL STRAIN STRESS	TIME= 900.00 TEMPERATURE RECH. STRAIN FLANSILC STRAIN TOTAL SIRAIN STRAIN
TEMPERATURE TEMPERATURE MECH. STRAIN PLASTIC SERA TOTAL SERAIN STREIS	TIRES 650.30 TERPEBATURE RECH. STRAIM FOTAL STRAIM STRESS	TEMPERATURE MECH. STRAIN PLASIIC STRAIN STREET, STRAIN STREET, STRAIN STREET,	TERPERATURE TECHOO SECTION STREES	TEMPERATURE TEMPERATURE TECH. SERAIM PLASTIC STRA TOTAL SERAIM SERESS	TEMPERATURE HECH. STRAIM FOTAL STRAIM STRESS	TIME= 900.0 TEMPERATURE ELGH. SIRALU FLASTIC STRY TOTAL SIRALU STALUS



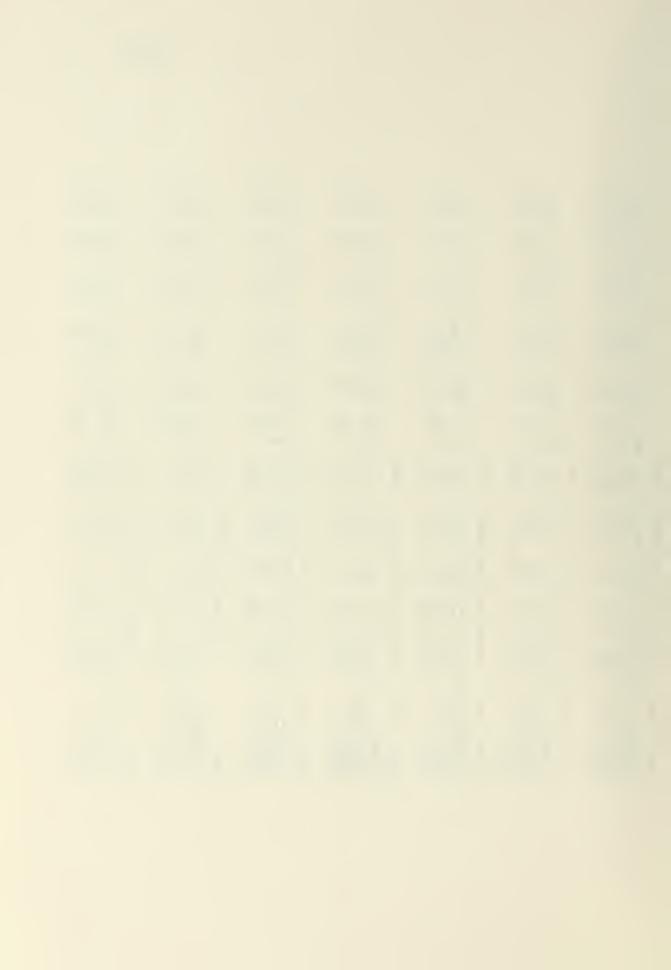
151.46 -0.033 7.0 0.531	151.44 -C.634 0.0 0.936 -1.002	151.44 -0.034 0.930 -1.02	151.44 -0.043 -0.0 0.920 -1.293	151.44 -0.043 0.00 0.920 -1.293	151.44 -0.043 0.0 0.920 -1.293	151.44 -0.043 0.05 0.920 -1.293
152.67 -0.037 0.0 0.931	152.04	152.04 -0.038 -0.0930 -0.930	152.04 -0.048 6.0 0.720	152.04 -0.048 0.0 0.920	152.04 -0.048 0.0 0.920 -1.414	152.04 -0.048 0.920 -1.414
152.49 -0.343 0.5 0.931	152.79 -0.343 3.0 0.930 -1.276	152.74 -0.043 0.933	152.79 -0.053 0.0 0.920 -1.567	152.79 -0.053 0.0 0.920 -1.567	152.79 -0.353 0.0 0.920 -1.567	152.79 -0.053 0.920 -1.567
155.34 -0.057 0.0 0.931	154.84 -0.057 0.0 0.930 -1.690	154.44 -0.057 0.930 -1.630	154.84 -0.067 0.0 0.920 -1.981	154.84 -0.067 0.0 0.920 -1.981	154.84 -0.067 0.0 0.920 -1.981	154.84 -0.067 0.0 0.920
156.27 -0.066 0.031 -1.953	156.00 -0.065 0.0 0.930 -1.927	156.00	156.69 -0.075 0.0 6.920 -2.218	156.03 -0.075 0.0 0.920 -2.218	156.00 -0.075 0.0 0.920 -2.218	156.00 -0.075 0.0 0.920 -2.218
156.39 -0.066 0.0 0.931 -1.976	156.11 -0.06 0.3 0.930 -1.949	156.11 -0.06 0.0 0.933	156.11 -0.075 0.0 0.920 -2.243	156.11 -0.075 0.0 -2.240	156.11 -0.075 0.0 0.920 -2.240	156.11 -0.075 0.0 0.920 -2.240
5 PASS 156.58 -0.008 0.0 0.431 -2.016	5 PASS 156.30 -0.007 0.00 0.930	5 PASS 156.36 -0.367 0.930 -1.987	6 PASS 156.30 0.377 0.920	6 PASS 156.30 -0.077 0.9 -2.277	6 PASS 156.30 -0.077 6.0 0.923	6 PASS 156.30 -0.077 0.3 6.920
156.66 -0.068 0.0931	156.37 -0.067 0.30 -2.002	156.37 -0.367 6.0 0.930 -2.002	156.37 -0.077 0.0 -2.293	156.37 -0.377 0.920 -2.293	156.37 -0.077 0.0 0.920 -2.293	156.37 -0.077 0.0 6.920
0 156.73 69 -0.369 13 0.931 59 -2.345	156.43 -0.068 0.0 -2.014	BULII-PASS 50 156.43 0008 -0.008 0.0 0.0 0.0 0.930 0.930	156.43 -0.077 0.0 -2.305	AULTI-PASS 50 156.43 078 -0.077 0 0.0 920 0.92C 319 -2.305	EULTI-PASS 50 156.43 078 -0.077 0 0.0 920 0.920	NULTI-FASS 50 156.43 078 -0.077 0 0.0 920 0.926
156.8 -0.0 0.09	INVOLVE NULTI-PASS 07 156.50 156.43 624 -0.068 -0.068 711 0.0 0.0 910 0.910 0.930 486 -2.029 -2.014	ENVOLVE RUI 17 156.50 14 -0.008 711 0.0 930 0.930 486 -2.028	LMWCLVE RULTI-FASS 07 156.50 156.43 034 -0.078 -0.077 711. 0.0 0.0 920 6.920 0.420 197 -2.319 -2.305	15.6 -2 -2	156 00 -20	156 -00 -20
156.10 -0.024 -4.711 6.931	150.07 -0.024 -4.711 -0.930	156.67 -0.024 -4.711 0.930	150.07 -0.034 -4.711 0.920 119.197	150.07 -0.634 -4.711 0.220	150.07 -0.034 -4.711 0.920 139.197	ISC. 67 -0.034 -4.711 0.920
TUBE TRAIN TRAIN	1000.30 ATURE SIRAIR C STRAIR	1000.00 ALUNE STRAIN STRAIN	COOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOOoooooo	1.00 ATURE STRAIN C STRAIN	2.00 THURE STRAIM STRAIM	3.00 TURE TRAIN TRAIN
TEMPERATURE HECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TERES 1000.30 LERERATURE KECH. STRAIM PLASTIC STRAIM TOTAL STRAIM STRESS	TENPERTURE RECH. STRAIN PLASTIC STRAIN TOLAL STRAIN STRESS	TERPERATURE O.S. PLASTIC STRALZ STRANZ STRALZ STRANZ STRAN	TEMPERATUZE RECH. STRALM PLASTIC STRALM TOTAL STRALM STRESS	TIME 2.0 TEMPERATURE RECH. STRAIM PLASTIC STRAIM STRAIN STRAIM	TIME 3.00 TEMPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS



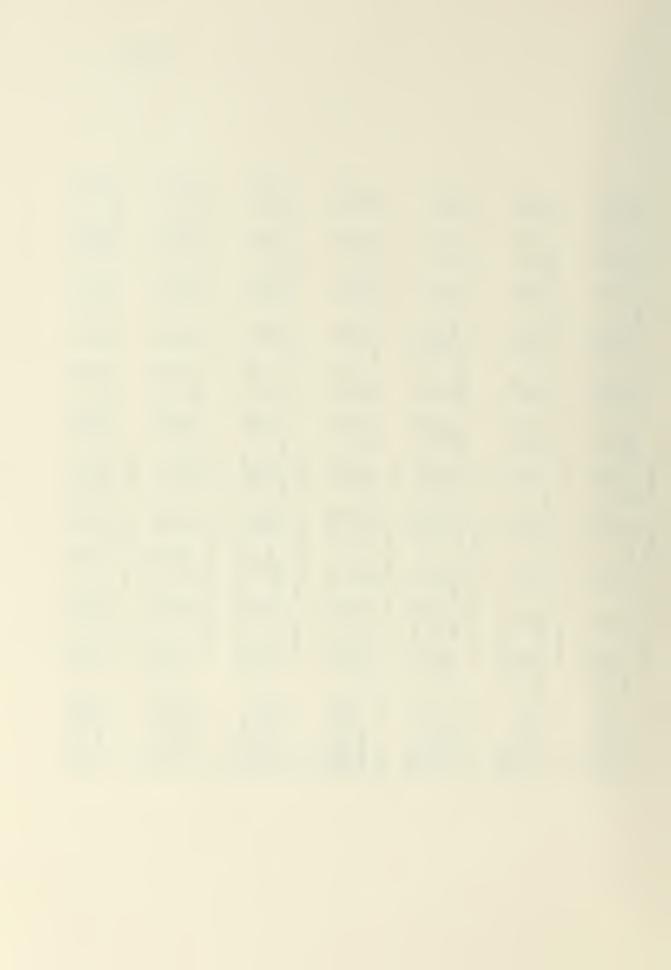
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ı	151.54 -5.64 -3.5 -1.253		151.44 -3.543 9.5 0.920 -1.293		151.44		151.44		151.44 -2.143 0.0 3.921 -1.274		151.44 -0.026 0.0 0.938 -0.759		151.44 C. C97 0.0 1. C61 2. U'ac
1	152. a -1a. 0 0i.		152.04 -3.446 C.C 0.923		15.2.34 - 0.048 C.0 0.920 - 1.414	•	152. Ju -0.048 0.0 0.0 0.120 -1.410		152.04 -0.047 0.0 0.921 -1.199		152.04 -0.030 C.0 0.33h -0.480		152.04 6.133 0.0 1.061 2.175
ŀ	152.7 c -(-, 5) -(-, 5) -(-, 92. -1,587		152.79 -3.353 5.0 0.423 -1.567		152.79 -0.353 0.0 0.520 -1.567		152.79 -0.053 0.0 0.423 -1.566		152.79 -0.352 6.0 0.921 -1.552		152.79 -0.035 0.0 0.934 -1.032		152.79 6.084 3.0 1.001
ĺ	154.54 -C. Cu7 0.0 0.923 -1.941		154.84 -0.047 0.0 0.923 -1.981		154.84 -0.067 0.0 0.920 -1.931		154.84 -0.067 0.0 0.720 -1.981		154.84 -3.366 0.0 0.521 -1.966		154.84 -0.049 C.C C.93d -1.447		154.84 0.0 1.061 2.237
ı	156.00 -0.075 0.0 0.925 -2.218		156.00 -0.975 6.5 0.920 -2.218		156.00 -0.075 6.0 .0.920 -2.218		156.03 -C.075 0.0 0.420 -2.217		156.00 -0.074 C.0 0.921 -2.203		156.00 -0.057 0.0 6.938 -1.684		156.30 0.066 0.0 1.061
Ì	155.11 -1.075 0.0 0.420 -2.240		156.11 -0.075 C.0 0.920 -2.240		156.11 -0.075 0.0 0.920 -2.240		156.11 -0.075 0.0 6.920 -2.240		156.11 -0.075 C.0 0.921 -2.225		156.11 -0.057 0.0 C.938 -1.706		156.11 0.065 0.0 1.061
6 PASS	156.30 -0.671 0.920 -2.277	6 PASS	156.30 -0.377 6.6 0.920 -2.277	6 PASS	156.30	6 FASS	156.30 -0.077 0.3 6.926 -2.277	6 FASS	156.30 -0.076 0.0 0.921 -2.263	6 PASS	156.30 -0.059 0.0 0.938 -1.744	6 PASS	156.31 C.064 0.0 1.361
EFFECT	156.37 -C.C77 0.0 C.926 -2.293	EPPECT	156.37 -0.077 0.0 0.920 -2.293	EPFECT	156.37 -0.077 C.3 0.920 -2.292	EPFECT	156.37 -0.077 0.0 0.920 -2.292	LPFECT	156.37 -0.077 6.6 0.921 -2.278	EFFECT	156.39 -0.059 0.0 C.938 -1.762	EFFECT	156.45 0.063 0.0 1.061
RULTI-PASS	156.4J -C.677 J.J C.920 -2.305	TI-PASS	156.43 -0.377 0.0 0.920 -2.335	INVOLVE RULTI-PASS	156.43 -0.077 0.0 0.923 -2.305	INVOLVZ RULTI-PASS EFFECT	156.43 -C.077 U.0 C.926 -z.305	INVOLVE HULTI-PASS EPPECT	156.45 -0.077 0.0 0.921 -2.294	INVOLVE AULTI-PASS	156.55 -0.060 0.0 0.938 -1.794	INVOLVE MULTI-PASS EPPECT	157.29 0.057 0.0 1.661
	156.50 -0.078 0.0 0.920 -2.319	INVOLVE RHLTI-PASS	156.56 -0.078 6.0 0.920 -2.319	TAE HOT	156.50 -0.078 0.0 0.920 -2.319	TAS BUL	156.52 -0.078 1 0.0 0.423 6 -2.323	TAE HOL	156.76 -0.079 0.0 0.921 -2.357	LVE AUL	159.67 -0.082 0.0 0.938 -2.429	LVE AUL	171.72 -0.042 0.0 1.061 -1.240
INAOTAF	154.07 -0.01# -4.711 0.920	INVO	150.07 -0.034 -4.711 0.920 139.197	INVO	150.09 -0.034 -4.711 0.920 139.193	INVO	154.39 -0.036 -4.711 0.920 139.126	THAO	159.77 -0.100 -4.711 0.921 137.699	INVO	331.62 -1.323 -4.711 0.938 98.596	OARI	2504.00 -17.564 -17.564 1.061
4.00	TEAPERATURE BECH: SEAALM PLASTIC STRAIM TOTAL SEAALM STRESS	2.00	TUBE ENTH THAIN	00.9	TERPERATURE MECH. STRAIM PLASTIC STRAIM TOTAL STRAIM	7.30	TERPERATURE RECH. STRAIN PLASFIC STRAIN TOTAL STRAIN STRESS	8.00	TEMPERATURE RECH. STRAIM PLASTIC STRAIM TOTAL STRAIM STRESS	9.00	TEMPERATURE RECH. STRAIN PLASTIC STRAIN STRESS	10.00	18 H
TIRE	TERFERATURE HECH. STAAIN PLASTIC STRA TOTAL STRAIM STRESS	TIME=	TEAPERATURE RECH. SIRAIM PLASTIC STRAI TOTAL STRAIM STRESS	TIRE.	TERPERATURE MECH. STRAIN PLASTIC STRA TOTAL STRAIN STRESS	TIRE=	TERPERATURE RECH. STRAIN PLASFIC STRA TOTAL STRAIN STRESS	1	TEMPERATURE RECH. STRAIM PLASTIC STRA TOTAL STRAIM STRESS	TIRE=	TEMPERATURE RECH. STALIN PLASTIC STRA TOTAL STRALN STRESS	TIBE	TERPERATURE RECH. STRAIM PLASTIC STRAI TOTAL STRAIM STRESS
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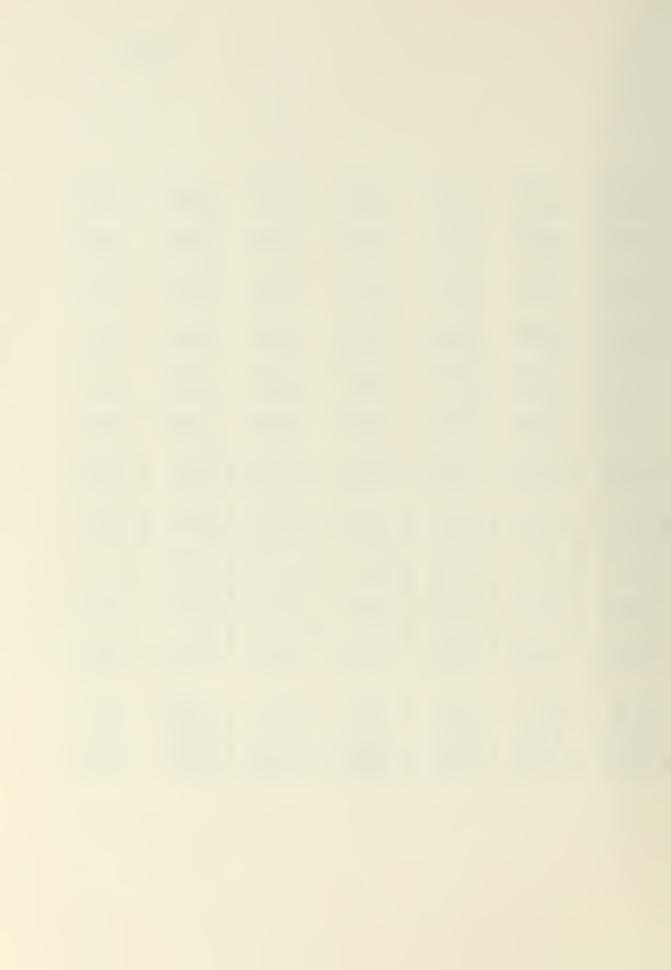
	151.44 0.168 0.0 1.071 3.204	151.44 0.123 1.007 3.661	151-44 C.C.51 1-614	151.44 0.058 0.0 1.021	151.44 0.062 0.0 1.026 1.851	151.44 0.063 3.0 1.027 1.877	151:44 5.063 1.027 1.879
	152.04 C.104 0.0 1.071 3.083	152.04 0.119 1.037 3.040	152.04 C.C47 0.3: 1.314	152.04 0.054 1.021	152.04 0.058 0.0 1.026 1.730	152.34 C.C59 0.0 1.027 1.756	152.34 0.05v 0.0 1.027 1.758
	152.79 0.098 0.0 1.071 2.930	152.79 0.114 0.0 1.067 3.387	152.79 C.C42 0.0 1.C14	152.79 0.0 1.021 1.449	152.79 0.053 0.053 1.026 1.577	152.79 0.054 0.0 1.027 1.604	152.79 2.054 6.0 1.027 1.027
	154.84 C.085 0.0 1.071 2.515	154.84 0.100 0.0 1.087 2.972	154.84 0.028 0.0 1.014 0.823	154.00 0.0 1.00 1.00 1.00	154.84 0.039 1.026	154.44 0.00 1.027 1.188	154.64 0.040 1.027 1.190
	156.00	156.CU 0.092 0.0 1.087 2.734	156.00 0.020 0.0 1.014 0.586	156.01 0.027 0.0 1.021 0.795	156.02 0.031 0.0 1.026 0.423	156.03 0.632 0.0 1.627 0.946	156.06 0.032 0.00 1.027 0.942
	156.11 0.076 0.0 1.371 2.255	156.12 0.091 0.0 1.087 2.711	156.12 0.019 1.01# 0.562	156.14 0.026 0.0 1.021 0.769	156.18 0.030 0.0 1.026 0.85J	156.24 0.00 1.627 0.903	156.45 0.030 0.030 1.027 0.862
6 PASS	156.34 0.074 1.071 2.268	156.446 0.049 0.0 1.087 2.645	156 PASS C.015 0.0 1.014 0.452	6 PASS 0.016 0.0 1.021 0.467	58.57 5.00.0 5.00.0 5.00.0 5.00.0	6 PASS 160.08 0.004 0.0 1.027 0.121	6 PASS 162.05 -0.010 0.0 1.027 -0.285
EPPECT	156.67	157.68 0.080 1.087 2.392	159.31 -0.003 0.0 1.014 -0.087	161.97 -0.018 -0.018 -0.018	165.72 -0.035 0.0 1.026	170.44 -0.067 0.0 1.627 -1.995	175.91 -0.105 0.0 1.027 -3.115
RULII-PASS	159.23 0.054 1.071	MULII-FASS 70 163.44 545 0.041 087 1.087 470 1.218	170.45 -0.080 0.0 1.014 -2.362	179.95 -0.138 0.0 1.021 -4.103	191.05 -0.211 0.0 1.026	1NVOLVE RULTI-FASS 79 350.33 202.72 513 -1.421 -0.293 171 0.0 0.0 927 1.627 1.027 191 -41.190 -8.658	1NVOLVE HULTI-PASS 29 507.19 214.10 692 -1.503 -0.374 477 6.0 0.0 027 1.027 11.027 525 -43.507 -11.043
INVOLVE RU	201.49 -0.239 0.0 1.071 -7.682	243. -0. -15.	INVCLVE NULTI-PASS 15 284,48 170,45 573 -0.895 -0.080 266 0.9 0.0 618 1,614 1.018 566 -26.227 -2.362	INVCLVE NULTI-PASS 12 316.84 179.95 076 -1.129 -0.138 242 0.0 0.0 021 1.021 1.021 864 -32.911 -4.103	INVCLVE NULTI-PASS 89 340,18 191.05 Jul -1.259 -0.211 0.4 0.0 0.0 0.6 1.626 1.026 521 -37.7cc -0.263	JSv. 33 -1.421 0.0 1.627 -41.190	307.19 -1.503 -0.0 1.027
ART .	2500.00 -17.554 -17.554 1.071	2500.00 -17.538 -17.538 -17.538	1498.15 -10.573 -1.0368 1.038	1363.12 -13.076 -13.242 1.864	1255.89 -9.381 -1.838 41.521	1157. 79 -6.513 -12. 171 1.027 59. 191	1574.29 -7.694 -11.471 1.027 75.525
11.00	=	=	26	o #	TUTE TEALN STRAIN	16.00 FULE FRAIN STRAIN	TIRE= 17.00 TEMPERATORE MECH. SIMALM PLASFIC STMAIM TOTAL SIMALM STWPSS
=ZKI!	TERPERATURE MECH: SIRAL PLASTIC SIRA TOTAL SIRAL SIRESS	TIMES 12.30 TEMPERATURE MECH. SCHAIN PLASTIC STRAI STRESS	TIME 13.00 TEMPERATURE RECH. SERAIN PLASTIC STRAIN STRESS	TIMER 14.00 TEMPERATURE MECH. STRAIN PLASTIC STRAIN STRESS	TINES 15.00 TERPZRATURE MECH. SIRAIM PLASTIC SIRAIM TOTAL SIRAIM STRESS	TEMPERATURE RECH. SIMALN PLASIIC SIMAL TOTAL SIRALS STRESS	TIRE= 17.0 TEMPERATURE MECH. SERAIN PLASTIC STRA TOTAL STRAIN STRYSS



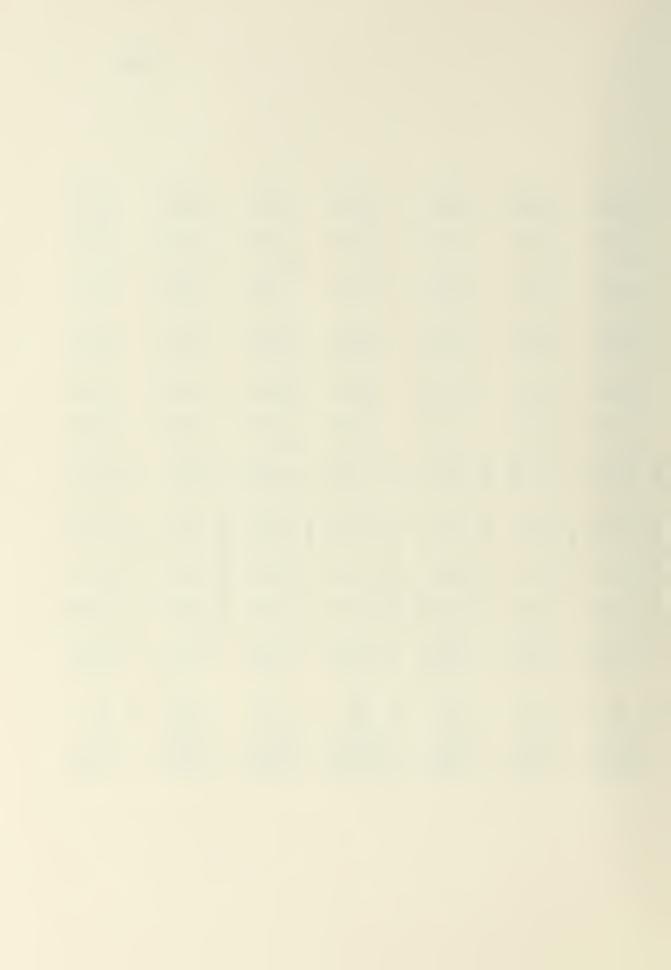
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	151.44 0.064 0.0 1.024 1.912	151.44 6.065 0.0 1.629	151.44	151.44 0.04 0.06 1.066 1.066	151.44 0.090 0.0 1.053 2.067	151.44 0.0 1.656 2.743	151.44 0.292 0.0 1.055 2.731
	152.34 0.00 0.0 1.028 1.712	152.04 0.061 0.0 1.229	152.04	152.04 0.078 0.0 1.046 2.336	152.64 0.00 0.0 1.053 2.546	152.04 0.0 0.0 1.056 2.622	152.04 0.088 C.C 1.055 2.610
	152.79 0.055 C.C 1.024 1.639	152.79 0.00 1.029 1.675	152.79 0.058 0.0 1.031	152.79 3.073 0.0 1.046 2.183	152.79 0.060 0.0 1.053 2.193	152.79 0.083 0.0 1.35e 2.469	152.75 0.043 0.0 1.055
	154.84 0.041 3.0 1.328 1.224	1.260	154.44 0.045 0.0 1.031	154.64 0.05y 0.05 1.046	154.85 0.066 0.0 1.053	154.94 0.068 0.0 1.356 2.033	155.19 0.0 0.0 1.355
	156.10 0.033 0.0 1.028 0.967	156.17 0.03 1.029 0.989	156.27 0.035 0.0 1.031	161.51 0.00 0.00 1.046 0.409	171.11	180.55 -6.108 0.0 1.056 -3.209	187.89 -0.160 0.0 1.055 -4.734
	156.52 0.030 0.0 1.024 0.881	157.12 C.027 0.0 1.029 0.796	157.59 0.026 0.0 1.031 0.764	168.36 -0.033 0.0 1.046	182.71 -0.126 0.0 1.653 -3.729	193.95 -0.202 0.0 1.056 -5.975	201.30 -0.254 6.0 1.055
6 PASS	164.54 -0.025 0.0 1.028 -0.753	167.19 -6.044 -1.229	170.55 -0.363 0.0 1.031	204.07 -0.263 0.0 1.046 -8.362	6 PASS 224.39 -0.420 1.053 -12.395	233.35 -0.48.2 0.0 1.056 -14.199	236.29 -0.503 -0.503 -1.055
EPPECT	181.85 -0.145 0.0 1.028 -4.303	184.00 -0.187 0.0 1.029 -5.536	194.15 -0.228 0.6 1.031	238.56 -0.529 0.0 1.046	254.67 -0.638 0.0 1.053	- .0.13	256.16 -0.648 0.0 1.055
INVOLUE RUL1I-PASS	224.92 -0.449 0.3 1.026 -13.254	INVOLVE NULTI-FASS 83 378-60 234-66 525 -1.587 -C.516 845 0.0 0.0 029 1.029 1.029 950 -45-870 -15-262	243.17 243.17 -0.577 0.01	TI-PASS -0.864 0.0 1.346 -25.297	FULTI-PASS 56 289.03 242 -0.890 0 0 0.0 054 -26.055	INVOLVE RULTI-PASS EPFECT 3120.51 283.43 258.09 342 -0.455 -0.455 -0.65	INVOLVE AULTI-PASS EFFECT 77 333.30 276.32 256.36 932 -3.994 -0.794 -0.64 853 0.0 0.0 0.0 055 1.055 1.055 1.05 679 -39 0.1 -1.24.241 -19.06
OLVE RU	.03 374.25 .059 -1.556 .925 -0.0 .028 1.024 .592 -44.943	378.60 -1.587 -1.587	18C.99 -1.603 0.0 1.031	INVCLVE NUL 659.50 J66.33 -3.038 -1.477 -8.180 0.0 1.346 1.046	LVE -11.	LAVOLVE RUL: -2.342 320.51 -2.342 -1.122 -0.017 0.0 1.650 1.050 128.360 -32.694	303.16 -0.994 -0.994 -1.055
INAC	1009.03 -7.059 -10.925 1.028 86.592	EN VO -6.525 -10.445 1.029 92.950	10.118 -6.081 -10.118 1.031 97.654	18 18 18 18 18 18 18 18 18 18 18 18 18 1	545.07 -2.679 -7.335 1.053	473.51 -2.302 -6.302 1.050 128.368	122.77 -1.452 -6.453 -1.055
14.30	FUER FRAIN STRAIN	19.00 TURE TRAIN SERAIN	20 - 20 - 20 - 20 - 20 - 20 - 20 - 20 -	TIME 30.00 TEMPERATURE MECH. STRAIM PLASTIC STRAIM TOTAL SCRAIM STRAIM	TO T	FIRE 50.00 ICHPERATURE LLCH. SINAIN ICASTIC STRAIN TOTAL SIRAIN STRESS	6C.30 LTURE TRAIN STRAIN
TIME	TERPERATUBE MECH. STRAIN PLASTIC STRAI TOTAL STRAIN STAES	TIME: 19.0 TEMPERATURE MECH. STRAIM PLASTIC STRAIM STRESS	TIME 20.0 TEMPERATURE MECH. STRAIM PLASTIC STRAIM STRESS	TIME 30.0 TENDERATURE MECH. STRAIM PLATIC STRA TOTAL SCRAIM STALES	TINE= #0.J TENPERATURE MECH. SIRAIN PLASTIC STRA TOTAL STRAIN STRESS	FIRES 50. IURPERATHRE C.CH. SINAL FLASTIC SINAL	TENDERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN



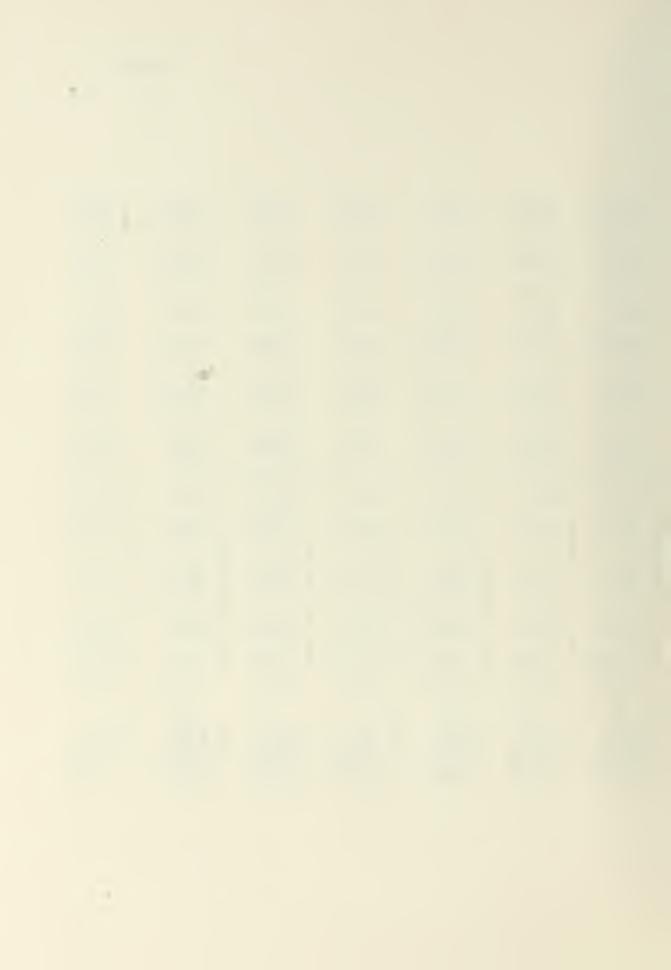
								•	,				
	151.44 0.090 0.0 1.054 2.683		151.44 0.0 0.0 1.051 2.601		151.44 6.084 6.0 1.048 2.504		151.44 0.081 0.0 1.043 2.399		151.44 0.062 0.0 1.026 1.850		151.44 5.045 6.0 1.009 1.341		100000 100000 100000
	\$52.04 0.086 0.0 1.054 2.562		152.04 0.0 1.051 2.480		152.04 0.060 0.0 1.048 2.343		152.64 0.077 6.6 1.044 2.278		152.04 C.C58 0.0 1.026 1.729		152.05 0.041 0.009 1.218		152.09 0.026 C.C 0.994 0.782
	152.79 0.061 0.061 1.054 2.409		152.79 C.378 0.9 1.051 2.327		152.79 0.075 C.C 1.344 2.229		152.80		152.91 C.052 0.0 1.026		153.24 0.033 0.0 1.009 0.976		153.96
	155.98 0.059 0.0 1.054 1.760		156.84 0.051 0.0 1.051		157.85 C.C40 C.C 1.043		158.93 0.029 0.0 1.044 0.877		163.62 -C.021 0.0 1.026 -0.629		165.86 -0.054 0.0 1.009		104.19 -0.373 0.0 0.94
	193.CC -0.197 0.0 1.054 -5.839		196.29 -0.223 0.0 1.051 -6.603		196.21 -0.240 0.0 1.048 -7.698		199.15 -0.250 C.0 1.044 -7.396		196.41 -0.249 0.0 1.026 -7.375		190.02 -0.221 6.0 1.309 -6.558		183.0C -0.192 0.0 0.0 0.993 -5.701
	205.63 -0.206 0.0 1.054 -8.461		207.86 -0.305 0.0 1.951 -9.007		206.68 -0.314 C.0 1.34H		208.55 -0.116 0.0 1.044 -9.152		201.95 -0.288 0.0 1.026 -8.523		193.44		146.04 0.0200 0.00 0.0442
6 PASS	236.09 -0.503 0.0 1.054 -14.836	6 PASS	234.25 -C.493 0.0 1.051 -14.529	6 FASS	231.56 -0.477 0.0 1.043	6 PASS	228.52 -0.459 0.0 1.644 -13.527	6 PASS	212.67 -0.364 0.0 1.026 -10.756	6 PASS	1999-61 -0.290 6.0 1.309 -8.588	6 PASS	190.10 -0.236 0.0 0.344
PPECT	252.52 -0.622 0.0 1.054 -18.298	EPFECT	247.87 -0.591 0.0 1.051 -17.357	EPFECT	243.06 -0.559 6.6 1.048	EPFECT	238.19 -0.526 0.0 1.044 -15.558	EPPECT	217.50 -0.398 0.0 1.026	LFFECT	202.57 -0.310 6.0 1.009 -9.159	EFFECT	191.85 -0.248 0.3 1.954 -7.362
RULTI-PASS	268.34 -0.737 0.0 1.054 -21.648	INVOLVE AULTI-PASS EPPECT	260.69 1 -0.684 0.0 1.051 1.051	INVOLVE RULTI-FASS	328.45 266.88 253.57 -1.189 -0.733 -0.636 -5.781 0.0 0.0 1.048 1.048 1.048	RULTI-PASS EFFECT	247.33 -0.592 0.0 1.644 -17.421	INVOLVE RULTI-PASS	221.74 -0.429 0.0 1.026 -12.652	INVOLVE MULTI-PASS EFFECT	204.95	TRVOLVE RULTI-PASS	757.0-
INVOLVE RU	384, 24, 289, 07 -1, 606, -0, 890 -6, 177 0, 0 1, 004 131, 969, -26, 050	OLVE AU	-1.376-0.8C4 -5.957 0.0 1.051 1.051	OLVE NU	266. BB -0.733 0.00 1.048 -21.513 .	INVOLVZ KU	258.02 -0.672 0.0 1.044 -19.743	OLVE NU	226.82 -C.865 0.0 1.026 -13.719	OLVE MU	203.87 207.75 -0.319 -0.346 -4.976 6.0 1.009 1.009	OLYE MU	175.02 -0.271 6.02 -6.998
ANT	364. 24 -1. 636 -6. 177 1. 024 131. 969	INA	154.60 -1.376 -5.957 1.051	TH AC	328.45 -1.169 -5.761 1.046	Z H V	307.42 -1.036 -5.637 1.044 134,350	Zh V	219.40 2 -0.555 -5.193 1.026	ART		ANT	103.53 -0.150 -4.604 0.994 136.594
76.03	TURE I SERALE	60.09	TURE THAIN THAIN	90.00	ATURE SIRAIA C STRAIR STRAIR	100.00	TENTERATURE RECH. STRALM PLASILC STRALM TOTAL STRALM STRESS	150.03	M ST	700.00	TENPERATURE RECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	256.13	TTURE STAIN STRAIN
THE	TENPERATURE MECH. SIRAIN PLASTIC STRA TOLAE STRAIN STRESS	TIRE=	TENPENATURE RECH. STRAIN PLASEIC SERA TOTAL STAIN STRESS	TIRE=	TERFERATURE RECL. SIRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIME=	TESTERATURE RECH. STRAI TOLANT STRAI STRAI STRAI STRAI STRAI STRAI STRAI STREES	1122=	TERFERATURE RECH. STEAIN PLASTIC STPA, TOTAL STRAIN STRESS	TIRE	TEMPERATURE MECH. STRAIN PLASTIC STRA TOTAL STRAIN STRESS	TIME= 25C.	FENERATURE MECH. STRAIN PLASTIC STR TOTAL STRAIN STREES



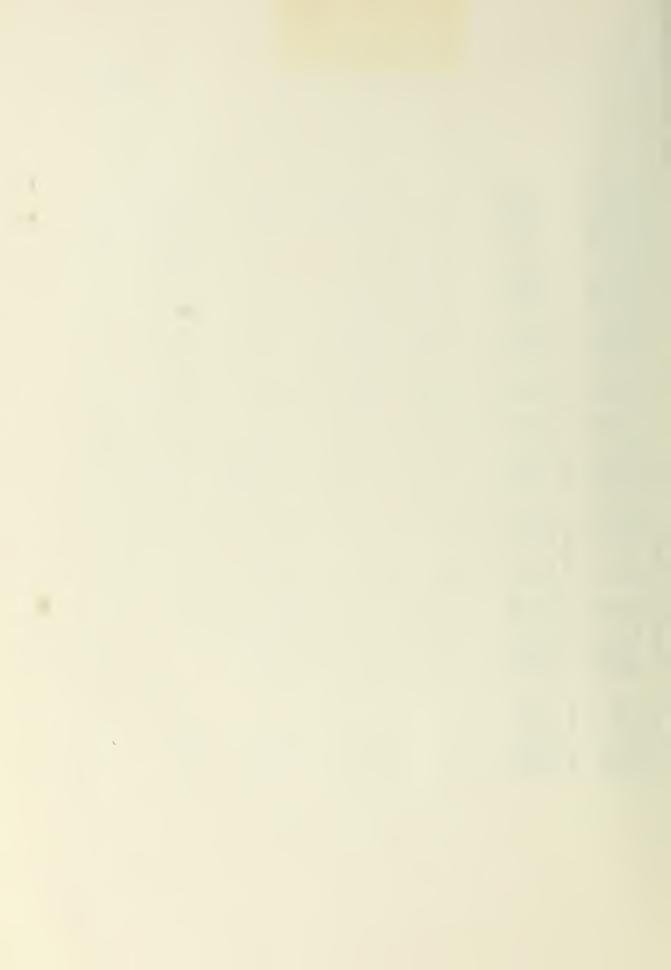
151.45 0.0 0.0 0.962	151.47 0.008 0.008 0.971 0.228	151.56 -3.001 0.0 0.963 -0.043	151.55 -0.004 0.00 0.955 -0.262	151.54 -0.0 0.00 0.950 -7.447	151.64 -0.020 0.0 0.945 -0.601	151.66 0.0 0.0 0.440
152.16 0.013 0.432	152.25 0.902 0.971 0.971	152.35 -0.007 0.0 0.963 -0.215	152 -0.0 0.0 0.0 0.45 0.45 0.45 0.45	152.52 -0.721 0.950 -0.635	152.58 -0.027 0.0 0.945 -0.793	552 -0.0 -0.0 -0.0 -0.540
354.34 -0.02 0.0 0.982 -0.046	154.64 C.034 C.034 0.971	154.74 -0.024 0.9 0.963	154.40 -0.021 0.00 0.00 0.00 0.00 0.00 0.00 0.00	154.73 0.00 0.00 0.450	154 cc1 -0.040 0.040 0.940 -1.204	25.00 20.00 20.00 20.00 20.00 20.00 20.00
165.53 -C.078 0.0 6.982 -2.324	164.44 -C.081 0.0 0.971	163.22 -0.082 0.953 -2.425	162.04 -C.081 0.0 0.955 -2.393	160.95 -0.073 0.00 0.953	159.98 -0.077 0.0 0.945 -2.296	154.14 -0.036 0.0 0.140
178.46 -0.168 0.0 0.982 -4.971	174.10 -0.148 0.0 0.971 -4.344	170.57 -0.132 f.0 6.963 -3.927	167.75 -0.120 0.0 0.955 -3.560	165.49 -0.110 6.0 0.950 -3.273	163.67 -0.103 0.0 0.0 -3.045	25.23 20.0 20.0 24.0 34.0 34.0
179.39 -0.178 0.0 0.942 -5.246	175.17 -0.155 0.0 0.971 -4.604	171.37 -0.138 0.0 0.963 -4.383	168 -0-12 0-12 -0-03 -3-69 -3-68 -3-68	165.95 -0.113 6.6 0.953	164.04 -0.105 0.0 0.945 -3.122	\$62.51 -C.0yy 0.0 0.0 -2.940
6 PASS 192.71 -0.197 0.0 0.902 -5.446	6 PASS 177.67 -0.168 0.0 0.971	6 PASS 172.74 -0.147 0.963 -4.369	6 PASS 164.17 10.0 10.0 13.455	6 PASS 166.74 -0.119 6.0 0.95J -3.528	164.06 -0.109 0.0 0.245	6 PASS -6.162 -5.162 -1.040 -1.040
143.83 -0.205 0.0 0.982 -6.077	177.86 -0.174 0.60 -5.157	173.31 -0.151 0.0 0.963 -4.487	169.79 169.79 10.0 10.0 10.0 10.0 10.0 10.0	167.06 -0.121 0.0 0.450 -3.554	164.92 -0.111 -0.0 0.945 -1.302	163.23 -0.164 0.0 0.940 -1.061
HULTI-PASS 91 164.HJ 219 -0.212 0 0.0 982982 505 -6.276	178.52 -0.178 0.0 0.971 -5.292	ABVOLVE MULTI-PASS 94 174. 12 173.70 051 -0.150 -0.154 744 0.0 0.0 943 0.963 443 -4.695 -4.583	170-14 -6.136 0.00 -4.049	167.33 -0.123 -0.950 -3.650	71 - PASS 165.13 -0.113 -3.345	INVOLVE KULII-FASS EFFECT 73 153.59 165.40 163.23 075 -0.166 -0.165 -0.16 722 0.0 0.0 0.0 0.0 94C 0.94C 0.94G 0.94 761 -3.156 -3.117 -3.06
LVE 185.	INVOLVE NULTI-PASS 76 179, 28 178, 52 076 -0.184 -0.178 764 C.0 0.0 971 0.371 0.971	174. 32 -0.150 0.0 0.903	INVOLVE MULTI-PASS 92 170.55 170.14 039 -0.139 -0.136 732 0.955 0.955 601 -4.131 -4.049	SUVCLVE NULTI-PASS 93 107.63 167.33 031 -0.125 -0.123 726 0.0 0.0 150 0.950 0.950 681 -3.711 -3.650	165.37 -0.114 0.0 6.945 -3.394	161.59 -0.106 0.46C -3.156
INVG -6.118 -4.600 0.982 139.029	163.76 -0.076 -4.764 0.971	156.98 -0.051 -4.744 139.445	155.92 -0.039 -4.732 0.955	154.94 -0.031 -4.726 0.750	152.64 -0.027 -4.723 6.945	151.7d -0.025 -4.722 0.946
TEMPERATURE TEMPERATURE TREHR STRAIN FOTAL STRAIN STREES	TIME > 550.30 TEMPERATURE ALCH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	TIRES 400.30 TERPERATURE MPCH. STRAIM PLASTIC STRAIM TOTAL STRAIM SCRESS	IIMER 450.00 PERFERNINE RECH. SIRAIM PLASIC SIRAIM JOIAL SIRAIM	TEMPERATUAE MECH. STRAIM PLASTIC STRAIM FOTAL STRAIM	TIME 550.30 TEMPERATURE RECH. STRAIN PLASTIC STRAIN TOTAL STRAIN	TEMPERS 600.30 TEMPERS STRAIN PLASSIC STRAIN TOTAL STRAIN STRISS



151.71 -0.328 0.937 -0.644	151.74 -0.031 C.C 0.934 -0.936	151.75	151.76 -0.036 0.930 -1.672	151.76 -0.038 0.926 -1.122	151.76 -C.C33 0.0 0.527 -1.159	151.7# -C.040 0.0 0.126 -1.191
152.59 -0.034 0.937	152.57 7.037 6.0 0.914 -1.105	152.54 -0.02 0.03.942 -1.171	152.51 -0.041 0.933 -1.224	152.47 -0.043 0.926 -1.256	152.52 -0.644 0.0 0.27 -1.313	20
154.23	154 - 12 -0 - 0 4 8 0 - 0 0 - 9 3 4 -1 - 4 19	153.96 -0.049 0.0 0.93.2	153.61 -0.353 0.933 -1.468	153.67 -0.051 0.050 0.92d -1.50%	153.55 -0.05 0.9 -1.523	975.0 975.0
158-43 -C.074 0.937 -2.208	157.43 -0.073 0.0 0.934 -2.172	157.12 -6.072 0.0 0.932 -2.140	156.93 -0.071 6.0 0.933	156.54 -0.070 0.926 -2.091	156.25 -0.670 0.0 0.927 -2.070	556.01 -0.069 0.0 0.926 -2.055
161.04 -0.092 0.0 0.937 -2.739	160.69 -0.069 0.0934 0.934	159.33 -C.086 0.0 0.932 -2.549	156.71 -0.083 0.430 -2.463	158.21 -0.082 0.928 -2.430	157.80 -0.6.80 0.0 0.927 -2.386	157.47 -C.079 0.0 0.46 -2.354
161.29 -0.394 0.0 0.937 -2.769	160.31 -0.090 0.0 0.934 -2.676	159.52 -6.C47 0.0 0.932 -2.587	158.48 -0.085 6.0 0.930 -2.517	158.37 -0.063 0.928 -2.462	157.95 -0.681 0.0 0.927 -2.415	157.61 -C.003 0.0 0.920
6 PASS -0.397 0.937 -2.877	6 PASS 160.68 -0.053 0.0 0.938	159.84 -0.089 0.0	6 PASS 159.17 -0.087 0.0 0.930	154.c3 -0.045 0.928 -2.516	6 PASS 158.20 -0.003 0.3 -2.465	6 [ASS 157.04 -5.002 0.0 0.926
LPPECT 161.89 -0.098 0.0 0.0 -2.912	16C.82 -0.094 0.0 0.534	159.97 -0.090 0.932 -2.679	159.29 -0.087 0.0 0.930	158.74 -0.085 0.928	26 ECT 158.29 -0.084 0.0 0.927 -2.485	157.94 -0.082 0.0920 -2.447
HULTI-PASS 19 162.03 100 -0.099 0 0.0 937 0.937 974 -2.941	16C.95 -0.094 0.0 0.934 -2.836	NULTI-PASS 20 160.08 092 -0.091 0 0.0 932 0.932 726 -2.701	11-PASS 159.36 -0.000 0.930 -2.619	158.81 -0.046 0.928 -1.5555	158.39 -C.084 0.0 0.927 -2.502	158.01 -0.083 0.0 -2.463
162. -0. -0.	14 VOLVE NULTI-PASS 84 161.08 166.95 025 -0.095 -0.094 722 0.0 934 6.934 6.934 776 -2.836	LVE hull 160.20 -0.092 0.0 0.932 -2.726	18VOLVE NULTI-PASS 42 159.49 159.36 027 -0.089 -0.088 722 0.0 0.90 930 0.930 0.930 734 -2.641 -2.619	INVOLV: NULTI-PASS 53 158.92 158.83 529 -0.047 -0.046 722 0.040 0.928 0.03 -2.575 -2.555	158-47 -0.085 0.0 0.927 -2.521	INVOLVE NULTI-PASS 30 150.10 150.01 340 -0.083 -0.083 722 0.0 926 0.926 0.926 638 -2.440 -2.463
151.22 -0.345 -4.722 -0.937 139.780	150.84 -0.025 -4.722 6.934 139.776	150.59 -6.026 -4.722 C.932	150.42 -0.027 -4.722 0.930	156.53 -0.029 -4.722 0.428 139.003	150.39 -0.030 -4.722 0.927 139.653	150.30 -6.330 -4.722 139.639
TEMPERATURE RECH. STRAIN PLASIC STRAIN TOTAL SIEAIN STRESS	TERPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRAIN	TEMES 750.00 TEMPERATURE MECH. STRAIN PLASILC SFRAIN TOTAL SFRAIN	TIRE BUD.000 TENFRANCE HECH. STRAIN PLASTIC STRAIN STRESS	TIRE # 050.003 EERPERATURE EERCH SIRAIN PLASIIC STRAIN STRESS	TIRE= 900.00 TEMPERATURE MECH. STRAIM PLASTIC STRAIM STRESS	TIME 950.00 LEMPERATURE MECH. STRAIN PASSIC STRAIN TOTAL STRAIN



TIKE= 1000.30	TNAC	TAE FR	INVOLVE AULTI-PASS AFFACT	FFECT	6 PASS						
TERPERATURE MECH. STRAIN PLASTIC STRAIN TOTAL STRAIN STRESS	150.23 -0.031 -4.722 0.925 139.625	157.80	157.72 -0.082 0.0 0.925 -2.432	-0.001 0.0 0.925 -2.418	157.56	157.34 -0.079 0.925 -2.354	157.21 -0.378 C.C 0.925 -2.328	155. b0 -0.069 0.0 0.925 -2.043	153.45 -3.352 3.0 0.925 -1.546	152.45 -3.046 -3.946 -1.362	151.73 -5.541 6.0 0.925 -1.217
TIRE= 1000.00	INVC	INVOLVE BUT	BULTI-PASS	EFFICT	6 PASS						
TEMPERATURE	150.23	157.80	157.72	157.65	157.56	157,34	157.21	155.90	153,35	152.45	151.73
MECII. STRAIN	-0.031		-0.042	-0.08	-0.061	510.0-	-0°018	-0.36		-C.0#	-0.04
PLASTIC STRAIN	-4.722		?.	0.0	၁ ၁	0.0	0.0	0.0		٠° د	0.0
TOTAL STRAIM	0.925		0.925	0.925	0.925	0.925	0.925	2.925		0.925	0.925
STRESS	139,625		-2.432	-2.418	-2.403	-2,354	-2.32B	-2.343		-1.362	-1.217





L679 Lipsey
c.2 Investigation of
welding thermal strains
in high strength
quenched and tempered
steel.

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Investigation of welding thermal strains

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